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10 June 1980

Worldwide Report

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

No. 122

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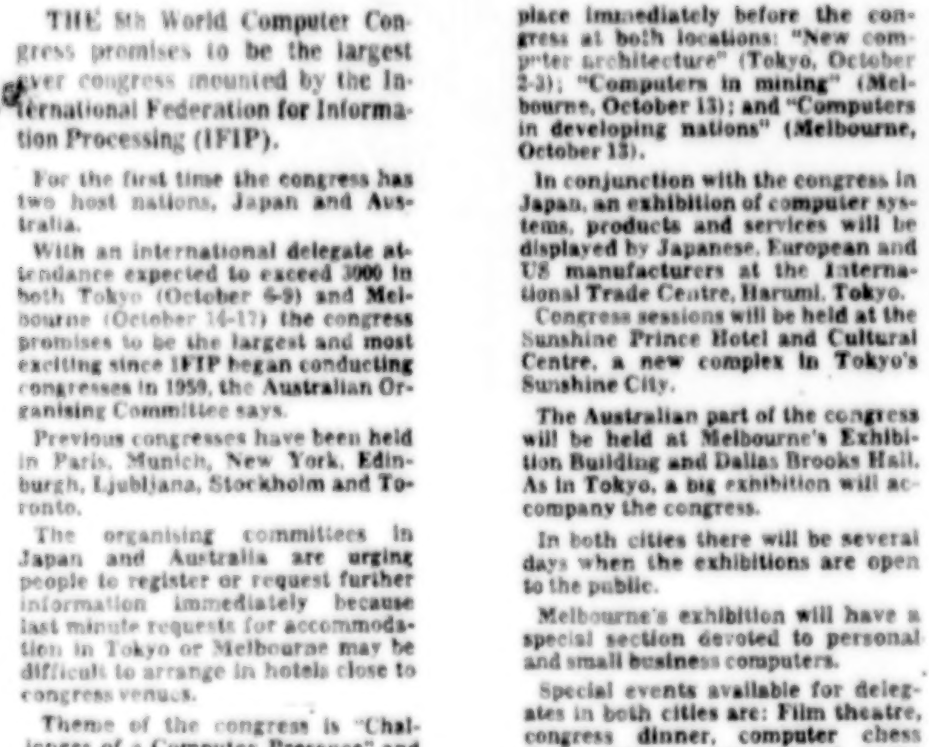
1980 WORLD COMPUTER CONGRESS TO MEET IN TOKYO, MELBOURNE

Canberra THE AUSTRALIAN in English 8 Apr 80 p 14

[Text]



THE 8th World Computer Congress promises to be the largest ever congress mounted by the International Federation for Information Processing (IFIP).

For the first time the congress has two host nations, Japan and Australia.

With an international delegate attendance expected to exceed 3000 in both Tokyo (October 6-9) and Melbourne (October 14-17) the congress promises to be the largest and most exciting since IFIP began conducting congresses in 1959, the Australian Organising Committee says.

Previous congresses have been held in Paris, Munich, New York, Edinburgh, Ljubljana, Stockholm and Toronto.

The organising committees in Japan and Australia are urging people to register or request further information immediately because last minute requests for accommodation in Tokyo or Melbourne may be difficult to arrange in hotels close to congress venues.

Theme of the congress is "Challenges of a Computer Presence" and a huge program of papers in the following fields will be presented in both cities.

Paper subjects include, Theoretical foundations of information processing; Computer architecture and hardware; Software; Database and information systems; Computer networks and communications; Computing in science and industry; Business and government applications; Social and economic implications; Information processing and education; and Computers in everyday life.

Several special seminars will take place immediately before the congress at both locations: "New computer architecture" (Tokyo, October 2-3); "Computers in mining" (Melbourne, October 13); and "Computers in developing nations" (Melbourne, October 13).

In conjunction with the congress in Japan, an exhibition of computer systems, products and services will be displayed by Japanese, European and US manufacturers at the International Trade Centre, Harumi, Tokyo.

Congress sessions will be held at the Sunshine Prince Hotel and Cultural Centre, a new complex in Tokyo's Sunshine City.

The Australian part of the congress will be held at Melbourne's Exhibition Building and Dallas Brooks Hall. As in Tokyo, a big exhibition will accompany the congress.

In both cities there will be several days when the exhibitions are open to the public.

Melbourne's exhibition will have a special section devoted to personal and small business computers.

Special events available for delegates in both cities are: Film theatre, congress dinner, computer chess demonstration, management game competition, computer art exhibition, numerous technical and post-congress tours to other areas of Japan, Asia and Australia, cultural exchange opportunities in Japan and Australia, including a "host" program and a junior world computer congress.

Registration fee for attendance in Tokyo and/or Melbourne is $210 for registrations received before June 30.

Registration forms and further information may be obtained from IFIP Congress 80, GPO Box 880G, Melbourne 3001.

CSO: 5500

BRIEFS

GABON, FRANCE SIGN AGREEMENT--The president of the republic, His Excellency El Haj Omar Bongo, this morning received in audience the French minister of cooperation, Mr Robert Galley. The discussions during the audience, which took place in the presence of the minister delegate to the presidency in charge of information, posts and telecommunications, centered on the forthcoming start of operations by the international radio transmitting station at Mouyabi. Shortly after the audience, the French and Gabonese ministers signed the agreement on the financing of the station. Before signing the document, Minister Zachary (Mivoto) expressed the satisfaction of the Gabonese authorities about the successful conclusion of the long and important negotiations with France which lasted for 2 years. He said this morning's event was of particular importance. [Text] [AB022000 Libreville Domestic Service in French 1830 GMT 2 May 80]

CSO: 5500

NEPAL, BANGLADESH TO HAVE DIRECT TELECOM LINK

Katmandu THE RISING NEPAL in English 8 May 80 p 1

[Text]

KATHMANDU, MAY 7:

NEPAL AND BANGLADESH WILL HAVE DIRECT TELECOMMUNICATION LINK BY NOVEMBER THIS YEAR, REPORTS RSS.

This was disclosed here today by the Bangladesh Minister for Post, Telephone and Telegraph, Mr. Mayeedul Islam who is currently on 4-day visit to this country.

Talking to RSS the visiting dignitary said that the link will be through establishment of stations at Bhadrapur, Nepal and Atwari in Bangladesh.

Bangladesh, Mr. Islam observed, would provide manpower technical assistance and latest equipment for installing the station at Bhadrapur.

As regards the utility of the new link the Bangladesh Minister noted: 'It would be most useful in providing quick communication channels to all Nepalese specially those tradesmen undertaking import-export transactions through the ports in Chalna and Chittagong in Bangladesh.

Referring to his hour long talks today with Nepal's Minister of State for Communications, Works and Transport Mr, Dambar Bahadur Malla, Mr. Islam said Bangladesh is ready to offer facilities to Nepal for printing postal envolopes and aerogrammes in his country on "cost basis".

He expressed the hope that a Nepalese team would visit Bangladesh in the near future to make a comprehensive study in this regard.

The national coordination meeting of Economic and Social Commission for Asia and Pacific sub-region 3,5,6, held in Dacca in January 1976, it might be recalled, had decided to establish a direct telecommunication links between Nepal and Bangladesh.

At the same meeting Bangladesh had offered one U.H.F. links to connect Bhadrapur and Atwari and to extend its high capacity microwave links upto Atwari.

CSO: 5500

BANGLADESH MINISTER OPENS REGIONAL COMMUNICATIONS PARLEY

Dacca THE BANGLADESH TIMES in English 8 Apr 80 pp 1, 9

[Text] Information and Broadcasting Minister Mr Habibullah Khan on Monday underscored the need for interaction of communication and participation in one another's development activities among the regional countries to make the region a "happy family."

The Information Minister was inaugurating a regional seminar on "Communication and Development" organised jointly by the Asian Mass Communication Research and Information Centre (AMIC) and Press Institute of Bangladesh (PIB) in cooperation with the Ministry of Information and Broadcasting at a local hotel.

Mr Habibullah Khan said, "at regional level, communication has problems. The regional countries seem to be hardly known to one another. In many cases we seem to know less of our neighbours than we know of some of the far away countries. In spite of having age-old cultural ties, the neighbours suffer a great deal from lack of communication."

The inaugural session was addressed by Mr Khorshed Alam Secretary, Ministry of Information and Broadcasting, Dr P.R.R. Sinha, Director, AMIC and Syed Murtaza Ali, Chairman PIB. The session was attended among others by Khandaker Abdul Hamid, Minister for Youth Development, High Commissioner of Sri Lanka in Bangladesh senior journalists and representatives of communication services.

The week-long seminar is being participated by 27 communication practitioners, journalists and academicians from 10 countries including Bangladesh.

Nine other participating countries are: India, Pakistan, Indonesia, Nepal, Malaysia, Sri Lanka, Philippines, Singapore and Thailand. Nine observers from nine different organisations are also attending the seminar.

Regretting the role played by the international news agencies in transmitting the news from the developing countries, the Information Minister said, "good news or achievements of developing countries are no news to the five big news agencies who dominate the world news services." "Only disasters and bad news" from the developing countries were news for them, he said.

Imbalance News Flow

Referring to the imbalance in the news flow he alleged that undistorted usage of the news from the developing countries were not guaranteed by the multi-national agencies. 'Even despatches by local correspondents and stringers in many cases when reproduced in print or broadcast media tend to appear in distorted or motivated form," he said.

The Information Minister praised the efforts of UNESCO in evolving a solution to the existing imbalance in the news flow between the developed and developing countries. But, he said, more was needed to be done expeditiously and the world stability and peace were dependent on communication and development of the less developed countries.

He said that communication and development were closely and directly related. Without solving the problems of communication and meeting the need which it generated, man's major demands for basic needs to peace could not be satisfied, he said.

The Information Minister said that the pattern of communication technology in the developing countries had to be different from that applied in the developed industrialised societies. The process of communication and development had to be correlated and coordinated and one must support the other, he stressed.

Mr Habibullah Khan said that the people of Bangladesh were very proud of their independence and recently achieved democratic rights. But, he said, they were determined to change the situation regarding the economic dependence of the country.

He said that the people had to be motivated to take part in the development activities and persuaded to produce more by effectively communicating with them.

Mr Habibullah Khan said that production and development in the country had been geared up in the countryside by side strengthening supporting communication activities both at the individual and national levels. 'Almost daily meet-the-people trips by the President is the most significant application by an individual of communication technics in socio-political and economic development of the country,'he said.

He said that mass-media at the national level were trying to play their part in the socio-political and economic development of the country but were handicapped by out-dated technology and lack of resources.

The Information Minister said that most of the 400 news papers and periodicals in Bangladesh today lacked qualitative standard. 'In spite of the freedom of press being guaranteed by the constitution and practised more freely than ever before. The newspapers are apparently failing to cope with the demand for knowledge and their obligations to the people to inform.'

The Information Minister hoped that the newspapers would take a note of the situation and improve their standard and become effective partners in development processes.

He said that more technological support and assistance were needed to enable radio and television to play their important role in the development activities.

Khorshed Alam

Mr Khorshed Alam in his address of welcome said that mobilisation of the masses was essential through information and education in the development efforts of Bangladesh where resources were inadequate.

He hoped that the seminar would be able to evolve a common action of communication with a view to enhancing the expertise of the communicaters and increasing the communication input in the national development process.

Dr Sinha

Dr P.R.R. Sinha said that communication was one of the most important means to achieve the goals of development. But, he said, very little importance was given to integrating communication planning in the overall development planning in the developing countries.

CSO: 4220

TELECOM OFFICIAL TOUCHES ON ATTITUDE, PLANNED SERVICES

Melbourne THE AGE in English 8 Apr 80 p 23

[Report from Computer Desk]

[Text]

A senior Telecom executive last week defended the commission's perceived conservatism by saying that when introducing new technology it had to be certain it did not "chase every hare that came out of the burrow".

The general manager of customer services, Mr E. R. Banks, told a meeting of the Australian Computer Users' Association that even the sincerely held expectations of suppliers and users could cause a service to be started for which there was insufficient demand.

Also Telecom could be lapped by introducing new services which became redundant before they were up because even better equipment was introduced.

For example, the Australian Post Office, as it then was, introduced an early packet switch system in the 1960s which was overtaken by the development of intelligent terminals.

Mr Banks said: "Even though the equipment is still being used by Telecom for internal order processing, it represented, with hindsight, a resource mistaken by technology."

He acknowledged the importance of the data communications sector which was growing 40 per cent a year.

But it still represented only a small market of 20,000 Telex services and 26,000 Datel services.

He stressed the responsibility Telecom had to its users, particularly because it held the monopoly on communications in Australia.

Indeed, Mr Banks' sense of responsibility was underlined when the president of ACUA, Professor Brian Garner, said Mr Banks had chosen "customer services" as the title of his area of concern rather than the more usual one of "marketing".

Mr Banks said Telecom had a responsibility to improve and extend communications techniques.

It had to be on the alert to take advantage of new ways of providing services.

But it had also to service the rural areas as well as the large cities where data communications users were concentrated.

He said Australia ranked 10th in the world for the number of telephones compared to the size of the population.

Australia had 44.4 telephones a hundred people, ahead of countries such as West Germany, Britain and France.

The network was also of high quality in terms of transmission volume and connection speed.

In all 88.5 per cent of all trunk calls and 31.8 per cent of international calls were subscriber dialled.

Mr Banks said the nature of data communications was changing as organisations restructured their information flows around teleprocessing systems.

Lower computer prices and cheaper communications together with higher labor costs had created a favorable environment for additional teleprocessing applications.

Among proposed innovations he said Telecom intended to lift within a year the maximum transmission speed on the public telephone network from the present 1200 bits a second to 4800 bits a second.

The 4800 bits a second modem, which coded and decoded information, should be readily available by mid-1980, with the 2400 bits a second modem by early 1981.

A back-up facility, known as a switched network adaptor, would be available with both modems.

It would be located between the modem, the leased line and the public switched network.

Two other new applications would be corporate data and message systems and electronic funds transfer.

The first would support the traditional applications of input, processing and output of data transactions as well as newer message applications such as internal correspondence, progress checking and reporting.

Electronic funds transfer would include credit checking, electronic clearance of cheques and debit card operations.

Mr. Banks said that, to date, the analogue telephone network had provided the basis for data communication but now there was a need for digital networks and those with switching capability.

He said plans for a digital data network had been moved forward by a year because proven systems were now available. They offered substantial cost savings and increased market opportunities.

The pilot network connecting Melbourne, Canberra and Sydney should begin in September 1981 with a nationwide system by the end of 1982 rather than the end of 1983 as originally planned.

The DDN would give faster connection and restoration times.

Details of the networks would be released soon.

Telecom also aimed to offer a packet switching service by 1982.

In packet switching, data is sent between source and destination in convenient size segments called packets.

The technique ensures that transmission paths are used very efficiently. It allows high peak data transfer rates, low transit delays and low error rates.

Its overriding advantage is that it provides a framework for data communications between different equipment and uses standard exchange techniques.

Mr Banks said that by 1982, 14 other countries would be offering packet switching networks.

Finally he said that within three or four years, Telecom expected to introduce a specialised public switched network for communicating word processors. This would be called Teletex.

AUSTRALIA

BRIEFS

COMMUNICATIONS WITH NORTH--The [West Australian] State Government will take further action in a bid to improve communications in the North of WA. The Premier, Sir Charles Court, said yesterday that he had written twice to the Prime Minister, Mr Fraser, in the past few weeks about the breakdowns of the coaxial cable to the Pilbara and the land line to the Kimberleys. He had asked Mr Fraser to increase the maintenance staff and equipment in the area to enable quick repairs to be made, speed up planning and construction time for the broadband system through to the Kimberleys and provide backup radio telephone equipment till the broadband system was available. He had also asked increased research into ways of preventing damage by lightning strikes and for recognition of the importance of a satellite as a communications backup. Sir Charles said he hoped to have talks with the chairman of Telecom, Mr R. D. Somervaille, when Mr Somervaille visited WA this week. [Excerpts] [Perth THE WEST AUSTRALIAN in English 3 Apr 80 p 19]

TELEVISION IMPROVEMENTS--The Commonwealth Government has called applications for a television repeater station to improve commercial reception on the Gold Coast. The station would operate on the high frequency UHF level, which new television sets can accept. Repeater stations are used in many Queensland country areas to boost transmission to remote areas. A repeater to boost Gold Coast reception has been mooted for about five years. The repeater would be established at Mt Tamborine. Only established television stations are likely to apply for the licence. [Text] [Brisbane THE COURIER-MAIL in English 11 Apr 80 p 1] A television translator station to service the Northam area will begin transmissions on Monday. The corporate manager of South West Telecasters Ltd, Mr Ross Elliott, said yesterday that the new stations would be channel 55. It would be the State's first ultra high-frequency transmitter and the company's eighth country station. It was expected to service an area within a 60-kilometre radius of Northam over a 220-degree northwest to southwest arc. [Text] [Perth THE WEST AUSTRALIAN in English 12 Apr 80 p 2[illegible]]

DEFENSE DEPARTMENT COMPUTER--The Defence Department will buy one of the most sophisticated computer code-breakers in the world. Defence officials confirmed yesterday that Australia would buy an IBM computer, to be installed in the department, but not necessarily in Canberra. Official spokesmen have refused to give any details of the price of the computer or its actual purpose. They would say only that it would perform tasks connected with intelligence. It is believed the new computer will be more sophisticated than any of the equipment now being used at the joint Australian-American intelligence signals base at Pine Gap. [Text] [Melbourne THE AGE in English 15 Apr 80 p 14]

CSO: 5500

TELECOMMUNICATIONS INADEQUACY REPORTED

Dacca THE BANGLADESH OBSERVER in English 7 Apr 80 p 5

[Article by A.K.M. Jalaluddin]

[Text] There are about one lakh telephone connections in the country spread through 40 automatic and 300 manual exchanges. Thus with about 1.2 telephone connections per 1000 of population, the telecommunication infrastructure in Bangladesh is totally inadequate and compares unfavorably even with that of the neighbouring developing countries in the region.

Telecommunication as an important subsector of communication plays a vital role in supporting the national economic and social activities. The Government of Bangladesh is aware of the growing importance of this and has invested over 2000 million Taka on telecommunication development during the first five-year plan with further estimated expenditure of Taka 230 million during the two-year approach plan of 1978-80. Plans are also under way for a much larger investment during the second five-year plan. Telephone exchange capacity is expected to be raised from 104,000 at present to 250,000 by 1985 and thereafter at the rate of 15% per year as part of the perspective plan drawn up to the year 2000.

One of the basic requirements for the sustained development as well as efficient operation of the telecommunication services is the availability of adequately trained personnel in sufficient number. According to estimates there is an urgent need to train each year on an average 500 new personnel and 1500 existing personnel. The requirements of trained personnel will further increase in the future with anticipated substantial expansion of the telecommunication network.

Training of such large number of personnel called for establishment of different training institutions capable of imparting proper training in various aspects of telecommunication. This is particularly necessary to cope with the rapidly changing techniques in the field of telecommunications.

A significant step in this regard is the proposed Telecommunication Staff College at Joydevpur, 35 kms from the capital city. The foundation of the Staff College was laid by the Honorable Minister for Post, Telegraph and Telephone in early March.

Sprawled over a plot of 75 acres, the Staff College would have an academic building, four blocks of hostel, staff quarters and other facilities. The estimated cost of initial construction is Tk 6 crore.

United Nations Development Programme (UNDP) would provide technical assistance in the form of expertise and equipment for the Telecommunication Staff College through International Telecommunication Union (ITU) which would be the executing agency for the project. In the initial phase of the project, the UNDP contribution would be 1.762 million US dollars.

The Telecommunication Staff College has been designed to undertake the following activities: i) Training of newly recruited Assistant Divisional Engineers, ii) Training of supervisory, middle and higher level management personnel in the new techniques and equipment being introduced in the telecommunication network, iii) Training of supervisory and management personnel in management, administration, accounting, stores and commercial aspects of telecommunication, iv) Development of job oriented training courses for all categories of personnel in the T&T, v) Training of instructors for all the Telecommunication Training Centres in the country, vi) Preparation and distribution of training publications and engineering instructions for use by the staff members in the field.

Another UNDP assisted project in Bangladesh in the field of telecommunication is the Telecentre at Tejgaon in Dacca. The work in this project started in 1977 and the Centre is now operational. It is equipped with modern and sophisticated equipment and training facilities. At present a team of nine members international staff including a Project Manager and eight experts is working at the Telecentre along with local experts. The UNDP assistance so far approved for the project amounts to nearly 2.5 million U.S. dollars.

The Telecentre at present trains telecommunication Engineering Supervisors, technical and skilled workers and telecommunication traffic personnel. It also conducts a large number of refresher training courses in selected areas for the management personnel. The Centre has a capacity to train three hundred persons at a time. This Centre would also act as an interim Staff College till the new one comes up at Joydeypur.

CSO: 5500

PLAN TO USE LONG WAVES FOR BROADCASTING DROPPED

Calcutta THE STATESMAN in English 10 Apr 80 p 9

[Text] Pune, April 9.--A plan to provide a round-the-clock national broadcast channel has fallen through, reports UNI. The plan, formulated by All India Radio's research engineers, envisaged the use of long waves, unlike the short and medium waves now in use.

The feasibility of using long waves for broadcasting was proved by the engineers after years of research on the effect of solar activity on the ionosphere.

The use of long waves, prohibited for the region, including India by the International Telecommunication Union, was advocated by A.I.R. since they could provide "very good" to "excellent" service to nearly 77% of the population with just one frequency assigned.

The plan was about to be finalized for international approval when an expert group got it scrapped despite its technical validity.

The group pointed out that the communication needs of aeronautical services and power transmission lines would be affected by the introduction of long waves for broadcasting.

A portion of the long wave band is used by the electricity authorities for maintaining power transmission lines, extending to over 75,000 km, with an additional 28,000 km in the offing in the sixth Plan. Once it is used for broadcast, the long waves cannot be shared with the present users. Nor was there any international support from the neighbouring countries for the proposal.

Adoption of long waves would have called for the conversion of 30 million radio sets in the country, even though the cost for every set would have been marginal. Long waves could have been used for providing cheap rural communication in the future.

The engineers are now trying to make the best of the available frequencies. The short wave bands were enlarged by 33% recently at the World Radio Administrative Conference in Geneva. The conference also allowed the continued use of short waves for domestic broadcasting in the equatorial region.

Despite the concession and the scope offered, A.I.R. is facing problems in providing satisfactory service in view of the "law of the jungle" that prevails in the use of the radio spectrum. On every frequency channel, there are a number of transmissions, of which, only the most powerful has any chance of being heard well.

A.I.R. is also facing difficulties, mostly financial, in using the large number of medium frequencies it obtained for operating low-power transmitters at the district level. In 1975, India was given 780 assignments, of which 280 were available only for daytime use. Of these, only 129 assignments have been used. It will be in force for 11 years till 1989. However, the use of the frequencies will not be satisfactory because of the interference caused by other countries.

CSO: 5500

[illegible]

[illegible]

[illegible]

MADRAS, April 4.

The Central Government would expedite the proposal to set up a radio station with transmitter and studio facilities in Madurai, Mr. Vasanth P Sathe, Union Minister for Information and Broadcasting, said here today.

Mr Sathe, who arrived here this morning from Delhi on a two-day visit to the city, told newsmen at the airport that the project had been included in the Sixth Plan. Sites for the transmitter and the studio had been selected and the land had been placed at the disposal of the Union Government. Now it was only a matter of according formal sanction to the acquisition of the sites by the Information and Broadcasting Ministry. He said he would see that work on the new radio station was started soon.

As regards the suggestion from various sections of the public to exempt cheap single-band radio receivers and transistor radios from annual licence fees he said, the Government was examining the matter.

Asked about a TV station for Bangalore he said the Government had already accorded its approval, but here also the question was one as this was done, construction would be taken up.

As regards the reported opposi- of selecting a proper site. As soon tion from cinema exhibitors in Karnataka to TV in Bangalore, he said "we must catch up with the modern technology and we should not lag behind other countries in this respect." The same argument, he added, held good for introduction of colour TV, which was not a luxury.

Shortly after his arrival in the city, Mr Sathe presided over the quarterly meeting of the Central Board of Film Censors and later met the members of the Advisory panel of the Film Censor Board, Madras.

In the afternoon he met representatives of the film industry, including members of the South Indian Film Chamber of Commerce and Film Producers Guild and had a discussion with them on the problems of the industry.

NATION CAUTIONED ON PARKING SPACE FOR INSAT

New Delhi PATRIOT in English 3 Apr 80 p 5

[Text]

BANGALORE, April 2 (UNI)

INDIA may lose its right to the "parking space" for its first domestic satellite INSAT if it does not occupy it within the notified period.

It is understood that the original date notified by India, 15 October, 1980, cannot be adhered to, as the American suppliers of the spacecraft have reportedly been unable to stick to their schedule of delivery. Even now no definite date is available.

INSAT can beam telecommunication and television signals originating from different points in India to the entire country. It is to be located over the equator above 74 degree east longitude.

INSAT is likely to be launched only in the first quarter of 1982, after a delay of 18 months.

Normally, a delay of 150 days in the launch after the prescribed date is allowed by the International Frequency Registration Board of the International Telecommunication Union.

Under a new decision effective from January, 1982 an extension of 18 months can be granted under special circumstances.

Space and communication experts are now preparing the case for extension to gain time, even before the enabling provision formally comes into force.

Even if they succeed, the experts point out the position would still be "touch and go" as after 15 April, 1982, the claim would lapse and it will be open to any country to occupy the "parking slot."

The possibility of China grabbing it cannot be ruled out as that country is on the look-out for a suitable position for its own satellite. The slot proposed for China is over 70 degrees east longitude, three degrees away from the position given to INSAT.

Experts say that it is not easy to find alternative slots in orbit. The synchronous orbit over the Indian Ocean is crowded with satellites and only certain slots in the orbit are ideally suited to serve the land mass below.

Insat will have two close neighbours, Marisat, an American satellite, and Palapa 11, one of the two Indonesian satellites.

The orbital position of 74 degrees east longitude now available to INSAT was acquired after a good deal of negotiations with the countries concerned and Intelsat. Even this position is said to be a compromise, as 25 per cent of the channel capacity of the satellite will go unutilised.

A spare INSAT will be located at 94 degrees east longitude, a position that can be occupied a little later. It cannot be used for the location of the first Insat, since there are no slots likely to be available for the spare one.

Further, India cannot hold on to the frequency allotted to the spare satellite indefinitely. The period of validity of the frequency assigned for it has to be notified in advance under a new provision that comes into effect from July this year.

It is also pointed out that the area of coordination of the earth stations will become larger and more complex after 1 January, 1982. The frequency co-ordination of the earth stations for INSAT will therefore have to be completed by then.

The reasons for the delay in the supply of the spacecraft have not been made public. Space engineers say that INSAT is not a usual communication satellite. It incorporates the latest technique of keeping itself stable, known as three-axis stabilisation.

This would be needed as more stringent regulations are in the offing to maintain the distance between any two spacecrafts so as to avoid interference.

CSO: 5500

BRIEFS

TELEPHONE EXCHANGE REPAIRS--Vientiane (KPL). Because parts of our automatic telephone exchange are old and in poor condition, it is necessary to make large-scale repairs. Therefore, we have decided to cut telephone numbers that are now in use off from the old exchange and issue new telephone numbers. This matter affects every telephone user. In order to plan for the new telephone numbers in a detailed, complete fashion which will facilitate publishing a new telephone directory for 1980 we have announced to all merchants and cadres who have telephone service in their homes to urgently prepare documents that state their right of ownership of a telephone at the Accounts Section, Department of Telecommunications before 5 April 1980. If this is done later than that, the department will grant no consideration. [Excerpts] [Vientiane KHAOSAN PATHET LAO in Lao 29 Mar 80 p 4]

CHAMPASSAK TELEGRAPH, TELEPHONE INSTALLATION--In 1979, the post and telecommunications cadres and workers of Champassak Province paid attention to servicing the tasks that had been designated for them by the party and the state in line with conditions. Along with that they facilitated contact between their province and others. This included receiving and sending letters, orders, mail sacks and other packages of the people. These totalled nearly 5 tons, generating income for the state above that for previous years. Along with carrying out those tasks, the telecommunications section also expanded the postal network to a great many base areas: One new post office was set up in a district and branch offices were set up in 25 cantons. Some 27 telephones were installed in the provincial capital and one 10 line exchange was installed. Two interprovincial telegraph circuits were installed. [Excerpt] [Vientiane KHAOSAN PATHET LAO in Lao 15 Jan 80 p A 5]

CSO: 5500

BRIEFS

SOVIET-AIDED POWER PLANTS--The construction of the Pha Lai thermoelectric power plant--the largest of its kind in Vietnam with a 640,000-kilowatt capacity--is about to start with Soviet assistance. For the past 2 years, especially since early 1980, tens of thousands of laborers have engaged in making preparations for the construction of the power plant. To date, with the help of Soviet experts, cadres and workers of the Ministry of Construction have completed leveling the main construction site of the power plant and moved as many as 5.1 million cubic meters of dirt and stone. [Hanoi Domestic Service in Vietnamese 1100 GMT 19 Apr 80 BK] Soviet specialists and Vietnamese workers at the Dong Hoi diesel power plant have completed the installation of two generators with a capacity of 7,000 kw. Soviet technicians and workers are accelerating the installation of two other generators and building a road leading to the plant. Some Soviet specialists, whose mission has ended, have volunteered to remain and work until the plant is completed. [Hanoi Domestic Service in Vietnamese 2300 GMT 25 Apr 80 BK]

CSO: 5500

BRIEFS

FIRST CIRCULAR-MODE TELEX SYSTEMS--The Polish telecommunications system became one of the few world producers of circular-mode telex systems. The first copy of such a system was completed at the District Post and Telecommunications Workshops in Lublin on the basis of a concept developed by Jozef Mozdzer, Eugeniusz Saj and Franciszek Jamroz from the Gdansk branch of the Institute for Communications. A ministerial commission is currently receiving the technically specified system which will subsequently be installed in the telex exchange in Lublin. The circular-mode system provides the capability of establishing automatic, simultaneous communications with 40 telex subscribers by dialling a single number. A total of 480 subscribers may be connected to the system, and 30 subscribers, such as the administrative office, fire department, militia, union of agricultural circles, etc., of a voivodship, may conduct the transmission of correspondence. The Lublin District Post and Telecommunications Workshops is starting series production of circular-mode telex systems; their application on a broad scale may result in the improvement of the management and control processes in government administration and many branches of the national economy. [Excerpt] [Warsaw TRYBUNA LUDU in Polish 16 May 80 p 4]

CSO: 5500

CONCLUSIONS OF REGIONAL BROADCASTING CONFERENCE REPORTED

Broadcasting Power Limits Set

Buenos Aires LA NACION in Spanish 28 Mar 80 p 18

[Text] The Conference on Radio Broadcasting in the hundred-meter band--Region II--which has been in progress since 10 March in buildings of the General San Martin Cultural Center will have its closing session today. During the afternoon Eng Roberto Juan Pablo Severini, technical undersecretary, will speak about the results achieved after 3 weeks of deliberations. In addition, it is anticipated that Brig Gen Eduardo Oscar Corrado, secretary of communications, will be present.

It should be pointed out that about 200 delegates, representing the 32 member nations of the International Telecommunications Union, participated in the meetings.

Results

It has been learned that the delegates participating in CARR/80 [American Region Radio Broadcasting conference/80] have agreed on rules to be followed at the next international meeting to be held in 1981, which will provide for the regulation of activity of the industry.

The agreements include an understanding in principle regarding the power which radio transmitters of the continent shoulduse, the uniform power output being 100 kilowatts for daytime transmissions and up to 50 kw for nighttime transmissions. The conference, according to some of its participants, was outstanding in its "cordiality and in the elasticity of the opinions expressed."

In this regard it was explained that the agreed formula will become effective in 1983 and that it will only affect the new stations in the area and consequently will not mean a change in power for those that are now in place.

Regional Conference Ends Harmoniously

Buenos Aires LA NACION in Spanish 29 Mar 80 p 16

[Text] Eng Roberto Juan Pablo Severini, technical undersecretary of communications, brought to a close yesterday the Administrative Regional Conference of Radio Broadcasting in the Hundred-meter Bank for Region II (America), the sessions of which were held starting 10 March in buildings of the General San Martin Cultural Center in Buenos Aires.

Eng Severini stated that fruitful agreements had been reached among the representatives of the 32 nations participating in the meeting. "The cumulative effect of positive acts makes one assume," he said, "that in the second part of the conference which will take place in November 1981, the technical basis necessary to facilitate the desired planning will be available."

As a result of CARR-80 [American Region Radio Broadcasting Conference-1980] it was agreed that a request should be made to the International Board for Frequency Registration, a body subordinate to the International Telecommunication Board, to the effect that it should undertake comparative studies to achieve a uniform separation of channels in all of region II.

Other Achievements

Another matter of great importance approved in CARR-80 was the setting of maximum power for the stations broadcasting in the hundred-meter band, particularly since there are some 9000 stations, and this is a positive factor for the elaboration fo the continental plan.

In addition, three areas of radio interference and their intensities in the nominally usable range have been defined. Finally, administrative procedures were worked out which will facilitate the consideration of existing needs, short and medium range, of the American countries in regard to radio broadcasting in the hundred-meter band.

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CSO: 5500

CHARGES AGAINST U.S. COMPUTER FIRM, MULTINATIONALS IN COMPUTER SECTOR

Deputy Makes Charge

Sao Paulo FOLHA DE SAO PAULO in Portuguese 6 Apr 80 p 6

[Text] Brasilia (Bureau)--Deputy Cristina Tavares (PMDB/PE [?Brazilian Popular Democratic Movement/Pernambuco]), has accused the government and private U.S. companies of seeking to take control of Brazil's data sector through domination of the area of data technology. She claimed that the recently formed Special Secretariat of Information is "the executive organ for denationalization of the sector, to the benefit of IBM, a multinational that controls 75 percent of the world computer industry."

According to the deputy, the decision to hand SERPRO [Federal Data Processing Service] over to private enterprise was "determined by the government's policy of denationalization and is aimed at its future domination by multinational capital."

ABICOMP President Claims Pressure

Rio de Janeiro O GLOBO in Portuguese 19 Apr 80 p 23

[Text] Giovanni Farina, president of ABICOMP (Brazilian Computer Industries Association), claimed yesterday that multinationals in the data sector are applying pressure against national computer companies. He explained that these foreign companies are seeking a share of the national minicomputer market, which is reserved for domestic enterprise.

Farina explained that the increasing demand for minisystems has made the domestic market "lucrative and promising," and thus has attracted the attention of the multinationals, "which always seeks to denationalize the profitable sectors of the economy." The strategy used by the foreign firms, he explained, is to deliberately sign "letters of intent to supply" and then to adopt a "fait accompli" tactic, presenting hundreds of these letters to the government organs as a means of applying pressure to have their deals approved.

Growing Market

The president of ABICOMP admitted that domestically produced minicomputers cost more than the foreign equivalent, "but this has no effect on the market because this difference is slight, no more than 20 percent over the price of other systems." In Farina's opinion, the domestic market is increasingly capable of absorbing the minisystems.

According to Farina, there are great possibilities for exporting national data systems, and Brazil will benefit mainly from two factors: "the existence of a competitive labor force and of highly qualified 'design' technicians." By next year, he said, domestic industry should initiate contacts to export microcomputers and terminal to LAFTA and even to European countries.

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CSO: 5500

COMMUNICATIONS MINISTER CITES PLANS FOR SATELLITE, PARTY LINE

Brasilia CORREIO BRAZILIENSE in Portuguese 16 Apr 80 p 10

[Text] Communications Minister Haroldo Mattos announced yesterday that Brazil will put a domestic satellite in orbit within the next 5 years. A genuinely national satellite, capable of covering the entire extent of Brazil's territory, it can be used for other ends, such as rural telephone service and meteorology. It also constitutes an excellent alternative to the Brazilian microwave system. The information was given during a press conference in which the activity of the Communications Ministry in this first year of this administration was summarized.

Mattos said that the studies and surveys conducted by the ministry regarding the domestic satellite indicated that the system would have countless advantages for the country. The ground stations are easier to use, hence less expensive, and moreover will be manufactured in Brazil.

The minister explained that the domestic satellite will insure greater reliability in the country's communications system, because the satellite will go into operation immediately if the ground system is interrupted for any reason. Regarding the possibility of sharing the project with Argentina, the minister said a binational project is possible, but there has been no decision or firm commitment to this end.

Party Line

Another innovation announced was the installation, within this year, of a telephone system using party lines serving two or more subscribers. He explained that under no circumstances would a subscriber be able to listen in on another's conversation with this system. "It will be very simple; when one subscriber is using the line, the others will automatically be prevented from using it." Mattos also referred to mobile phones. Supported by the present infrastructure, they will serve the high-income bracket. Subscribers will be able to make and receive calls using both DDD [Direct Distance dialing] and DDI [International Direct Dialing]. Only Brasilia has this service now.

He also reported that this year the Communications Ministry will install an information service using video signals. This is a system enabling users to consult data banks for information on everything from supermarket prices to weather conditions and stock market quotations. In collaboration with the Ministry of Agriculture, the ministry plans to set up an agricultural information service that would eliminate the commodity monopolist.

The minister further revealed that the Brus undersea cable, from Fortaleza to the Virgin Islands, will go into operation in August. Another undersea cable, from Recife to Dadan [as published], South Africa, via Portugal, will be laid in 1982.

Mattos said the Post and Telegraph Co is in the midst of a "budget dispute."

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CSO: 5500

SEVEN ROCKETS TO PUT TELECOMMUNICATIONS SATELLITE IN ORBIT

Rio de Janeiro O GLOBO in Portuguese 26 Mar 80 p 8

[Text] Sao Jose dos Campos--Air Force Gen Hugo Oliveira Piva, director of the Space Activities Institute [IAE], announced yesterday that the vehicle which will launch the first Brazilian satellite will consist of seven rockets, of which four will be in the first stage and the other three distributed over the second, third and fourth stages.

"Of these seven rockets, five are the same as the first stage of Sonda IV and the others are special engines," explained General Piva. "At present, vibration tests are being made with Sonda IV rockets, charging them with various loads in order to analyze reactions to wind gusts or fuel irregularities following take-off."

The tests are being made in the shops and laboratories of the Brazilian Aeronautics Company (EMBRAER), which has sophisticated instruments for conducting aerospace projects and which, according to the Air Force general, will be able to lower the cost of the program, budgeted at $600 million for the three complete launchings.

"If everything goes as we expect," he added, "the first Sonda IV firing will be made in the middle of 1982 and, what is more important, almost 100 percent of the rocket will be made from domestic materials."

According to the IAE director, who returned this week from the FRG, where he participated in a meeting between FRG and Brazilian experts in aerospace programs, the Brazilian domestic satellite "will probably be as much or more sophisticated than the American and European satellites now used by INPE [National Space Research Institute] for capturing spectral images."

Contrary to what has been reported, the Brazilian satellite will be a telecommunications space station. According to General Piva, once put into orbit it will have to be replaced annually. Although this is expensive, he believes the project is worthwhile in view of the services it will perform.

"It will primarily be an instrument intended to gather important informative data about the planet on which we live, but especially about Brazil. Some of its tasks include meteorology, hydrology, mineral resources, crop forecasts, forestry reconnaissance and even flood prediction."

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COMMUNICATIONS MINISTER CORREIA DE MATTOS INTERVIEWED

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 27 Apr 80 p 31

[Interview with Communications Minister Haroldo Correia in Brasilia by Carlos Chaga and Eliana Lucena; date not given]

[Text] The use of a large part of the National Telecommunications Fund money in other areas of development by the government was acknowledged by Minister of Communications Haroldo Correia de Mattos in an exclusive interview granted to O ESTADO in Brasilia. He regretted but justified what has happened. While the ideal thing would be to use all that money to develop the National Telecommunications System, in practice it is felt that it is important to attend to priority and more urgent problems such as education, health, housing for the people and others. In his own words, telecommunications in Brazil will not in itself suffer any stagnation since in view of the lack of resources for new expenditures, it was decided to improve the quality of services and to increase maintenance, something which has contributed greatly to national technology. Haroldo Correia de Mattos announced the implementation of several new telephone services such as that of information linked to television sets, the transmission of facsimile, the creation of semipublic telephones and party lines for more than one subscriber. He foresaw the launching of a domestic satellite by Brazil and Argentina in 4 or 5 years and he criticized the actions by certain persons in the Church, adding that if there had been telephone or correspondence censorship in the past, it was done "with great discretion and skill," and without involving the structure of the Ministry of Communications. Writers Carlos Chagas and Eliana Lucena participated in the interview.

[Question] It has been bruited about for more than a year that because of the reduction in expenditures, and in view of the economic crisis, the country will not have the money for new investments in the area of communications. If that is true, how is your work progressing?

[Answer] When a program is undertaken on a national scale, the great objectives should deserve priority. Within that context, all government sectors had their own restrictions. It seems to me, therefore, that it would also be normal that we make our share of sacrifices. A compromise should be sought between the possibilities for expenditure and the needs of the country. Since we could not maintain the same rate of growth, it was necessary to establish some criteria and use our imagination in seeking the solutions which in some way would compensate for that lack of resources.

However, there is no crisis that does not bring some sort of benefit, and as a result of that national problem, the communications sector embarked on a new series of solutions which are turning out to be very promising. It was absolutely necessary to improve the quality of services so that what we had already invested in would provide a better return, since it was impossible to make great expenditures. Therefore, we paid great attention to the area of maintenance, even seeking solutions which had never been used before. We created the network operations centers, we created information centers to prevent the subscriber from having to make a trip to seek information. That reduced our workload, required less building space to take care of the natural gathering of people, and it cut down on the number of people needed to take care of them.

We are making more use of our services by means of simplified codes and we are studying other alternatives: for example, we established the system of collect calls from public telephones. We are beginning the installation of semipublic telephones, which not only make but also receive calls. We are studying the possibility of using credit cards so that the people may make a telephone call from any part of the country. We are trying to encourage the creation of information centers in various sectors of activity such as banks. We are negotiating with the transportation sector for the creation of freight centers and we intend to install centers that provide information on prices. We are carefully examining party telephone lines without the violation of privacy for two or more subscribers. All of these are impositions resulting from the need to make better use of what we have.

[Question] An attempt is being made to make the installed system productive, however, will demand and the needs of the country not cause a bottleneck 10 years from now, for example, if there is no expenditure now?

[Answer] For a long time Brazil did not spend any money on telecommunications, spending which only began with Castelo Branco, the creator of EMBRATEL [Brazilian Telecommunications Company]. We really had the chance for a significant expansion in the telecommunications system from 1964 to 1978, so much so that in 1960 we had 1.5 telephones per 100 inhabitants and today we have 5.3 telephones per 100 inhabitants, despite our population growth. There was a substantial expansion. Actually, there is always the danger that we cannot maintain a rate of growth compatible with the increase in demand, which would necessarily mean a deterioration of services. However, that danger is counterbalanced by the measures to which I referred and which tend to give us a better return on the investments made, without ever losing sight of the needs for social services, which are a part of telecommunications.

For example, there is the installation in low-income residential complexes of semipublic telephones, party lines and rural telephone plans through agreements with cooperatives, and, in short, a number of new measures. Even so, some expenditures are made. We now have an information service through television sets, using telephone lines, under study in TELESP [expansion unknown]. That would be an additional income. Information of daily interest through consultation with a data bank which would be installed by someone. The telephone subscriber who owned a television set would have access to very broad information. TELESP has already installed a facsimile system, although on a very small scale, but we are using what we call vertical services. Mobile telephony is in the process of being instituted. We are opening new areas so as to make better use of that which already exists, such as the extension of television to the interior through agreement by several states of the federation with the transmitting stations. In short, the challenge is there and we are trying to use creativity to obtain better returns.

[Question] There were complaints about Minister of Planning Simonsen that he completely shut off access to the Treasury. Do you notice some difference with respect to Minister Delfin Netto that makes it easier to obtain money?

[Answer] I believe each of them is exactly in the role in which he should be. My position is not that of seeking more money from the Treasury because we do not need more money from the Treasury but simply we need to expand our limits of expenditures through our own resources. The position of a minister of planning is that of controlling the drive of each of the ministers, each of whom wants to develop his own area to the maximum despite the permanent and resounding comments by the press, which always blame the state companies for greater responsibility for inflation.

Therefore, it is not exactly the minister of planning who is holding us back but actually--and I do not even deny their origins--some of those criticisms. The telecommunications sector is not an inflationary sector. On the contrary, we frequently complain of the increases in rates and as a rule we forget to ask what we are saving by using the telephone.

That permanent conflict of ideas suggests new solutions and encourages their creation: Brazilian technology is truly producing and providing a fabulous contribution to our sector and to a reduction in imports.

[Question] There is some criticism that the minister of communications is bent on certain programs which are extremely sophisticated for the degree of difficulty which the country is undergoing, you even mentioned facsimile reception on video receivers.

[Answer] Excuse me, but that criticism is an atrocious absurdity, there was no expenditure in that sector which was not first guaranteed to bring a greater return.

The insignificant amount it was necessary to spend to create the direct dialing system was paid easily and provided an enormous compensation in the world of telephone traffic.

When the operator is allowed to make the call, when a call is made through the operator, she looks for a trunk line. If the line is busy she simply informs the subscriber that the circuits are busy. In an automatic system, she continues looking until she finds an idle circuit and completes the call.

Actually, the percentage of completed calls in an automatic system is incomparably better than a manual operation system. Moreover, after a telephone exchange reaches a certain size, it is absolutely impractical to use a human operator. It is necessary that it be automatic because the volume of persons employed and the area required for the installations would be of such size that such a type of exchange could not be maintained, particularly because of the cost of each square meter of land and the constructed area. There is absolutely no sophistication and that is even a very relative term. What is sophistication? Is it sophistication to use a facsimile? When an engineering office wants to send the particulars of a plan to its destination in a hurry, instead of sending a messenger by airplane, automobile or bus, the material is sent via facsimile, am I then sophisticating or saving time, money and fuel?

More and more we are approaching a society of information, and more and more information is becoming an item of immense value and extremely visible. Information that is not disseminated in time, deteriorates, perishes. What would happen to new papers if they did not have a good telex or telephone network? Telecommunications are above all instruments of socioeconomic development and they must keep pace with the requirements of demand.

[Question] Does the existence of large television nets in the hands of a few groups not constitute a danger?

[Answer] Life as a whole is a succession of risks and we have to evaluate them. When a calculated risk is taken, the evil is not great. The fact begins to become dangerous when an unwitting risk is taken, and the government is taking and seeking measures in that respect--that is a specific directive from President Joao Figueiredo--of encouraging the creation of a larger number of television networks.

[Question] The possibility of an official network does not exist?

[Answer] Up to now the government position is that of favoring private companies completely and there is not even an official radio network.

[Question] There are official radio stations.

[Answer] It was an inheritance we received, and the only measure taken recently was the creation of RADIOBRAS [Brazilian Radio Broadcasting Company], which is active mainly in the Amazon Region where there is nothing to attract private enterprise. We need to cover that area of silence, an area invaded by stations from abroad.

[Question] Will the domestic satellite come to complement the Amazon Region program? How are the Brazilian-Argentine agreements coming?

[Answer] The problem of the domestic satellite was taken up again recently. It is an interministerial problem because the Brazilian Space Activities Commission--COBAE--has a very active presence in that type of decision. It is our area to prepare studies and it is COBAE's area to make the great decisions. From our point of view, the domestic satellite --and it is always debatable--needs to be developed now for several reasons: once in orbit it will cover all of national territory. By the time it is in orbit--and that should be in 4 or 5 years--we shall already have the technology for manufacturing earth telephone and television stations locally. Those stations were much less expensive than imported ones. More so because in the domestic satellite the specifications for earth stations are much less strict than those for the stations which must operate with the international satellite. Therefore, our industry could supply us, could provide us with all the stations we would need.

That satellite would also have the capability of attending to a number of eminently social areas: education, medical assistance, rural telephone service, data transmission, and in the area of television itself, it will enormously simplify it because it would be enough to have one earth station anywhere in the country and television would be available to that region. Moreover, we would occupy a position in the geostationary orbit. Technology of today requires that the satellites remain in an orbit on the equatorial level at a distance of 36,000 kilometers from the surface of the earth and that they maintain the same angular velocity of the earth so that they will remain stationary. That orbit is naturally finite. As it becomes more occupied, there will be less space available and we are only interested in placing that satellite in a restricted arc so that it will remain over our territory.

[Question] The Ministry of Justice is reviewing the "Falcao Law" on publicity for candidates on television. Is the Ministry of Communications participating in that work?

[Answer] No, that is not our job. We do not have an infrastructure for that, we have no experience in the area. Actually, our position in the telecommunications sector is that of an adversary type. I believe, truly, that in order to enter into that type of activity it is necessary that one have advisory capabilities for analyzing the problem in all its scope. This is particularly so because time after time there are even contradictory opinions. A sociologist defends programs of violence because he believes that they provide a release for intrinsic violence. An educator believes the opposite. The ministry does not have the personnel to enter into that discussion.

[Question] Still on television, we know that the DENTEL [National Telecommunications Department] is going to undergo a reorganization. Why?

[Answer] The function of DENTEL is, first of all, that of analyzing the technical quality of transmissions, checking to see whether stations are operating on the assigned frequency and are not, because of transmission defects, radiating harmonics or subharmonices, whether their signals are covering the area they can cover and whether they are not unduly interfering with other stations. That is the role of DENTEL; a purely technical supervision.

[Question] Some years ago, during the time of the "Falcao Law," the Ministry participated actively in the discussions on program quality with the Ministry of Justice.

[Answer] Up to now it has had no participating of any type. Production quality is the job of the Ministry of Justice and the Ministry of Education, in my opinion. On 5 May, which is "Telecommunications Day," we have the intention of holding a meeting with all the radiobroadcasting businessmen of Brazil and also with radio amateurs on TVE of EMBRATEL. We are inviting Ministers Said Farah, Eduardo Portella and Ibrahim Abi-Ackel. I will make a statement of 5 or 10 minutes to each of the others also. However, it will be restricted to technical problems. Minister Portella will emphasize the cultural aspects, naturally, which must be exploited in radiobroadcasting.

[Question] What about the scientific and technological development program?

[Answer] We have a research center linked to the TELEBRAS [Brazilian Telecommunications, Inc.] holding company, which operates in Camphinhas. We are developing a number of programs with a view to replacing imports and undertaking that which has been referred to as leading technology: we are working actively on optic fibers and we had the pleasure of knowing that our technology for application in the area of electric power transmission was approved in Sweden by a firm which is willing to buy here in Brazil. There is another project, also very important, of the temporary electric power plants, whose concept we presented at a congress held in Paris a year ago which was praised, receiving many favorable comments in prestigious magazines in the field of telecommunications.

We are developing other programs, particularly because telecommunications are undergoing a period of transition. We abandoned what has been called analog systems to go into digital systems. Digital technology, such as the institution of electronic computation, is a reality today. It entered, penetrated and invaded the area of telecommunications and we are hastening also so that in the near future we shall be operating in the area of digital systems which have much greater efficiency, yield and possibilities than the analog systems.

[Question] What about exports?

[Answer] That is a national desire. Everyone wants to increase exports in all fields. However, the question should be asked of our industrialists. I believe that the greatest obstacle to our entry into the area of exports is not technological development itself nor the price, but the market, which is a jungle. Everything goes in that area. Our exporting tradition outside of coffee and soccer--which is no longer of the best--and carnivals, is not very great.

[Question] Even in terms of Latin America?

[Answer] We export to Argentina which has a great program of telecommunications development. It bought switching centers manufactured in Brazil. I do not know exactly how many terminals. I do not want to go into details because I should not, because it would be gauche. However, recently, we won a bid to provide telecommunications material for a Latin American country and a European country is pressuring the government of that Latin American country to give orders to its manufacturers.

[Question] What could Brazil export now in terms of providing for a large demand?

[Answer] It depends greatly on the market toward which we turn. For example, in terms of conventional computation centers, electromechanical devices, we can export to any country of the world. And those centrals still have a very large market. One of the possibilities I personally foresee would be that of partnering with other Latin American countries and creating a common market for a weather station, which would be developed together with Argentina and any other country. European countries have for a long time been developing multinational projects. The Concord is a typical example; the Airbus is another. In the field of space activities, they are also working together and they are countries which have a much greater economic potential than ours. Joint programs in Latin America would mean a reduction in our imports in terms of technology and even for lessening that terrible technological gap which separates us from the countries of the northern hemisphere as a rule.

[Question] Some years back there was a real phobia in Brazil about spy satellites. They said that the Russians and Americans photographed everything that took place in Brazil. Is there some concern in the Ministry of Communications with respect to that?

[Answer] In our ministry, as far as I know, there was never any concern and there is none now. That concern is not linked to our ministry but to that of national security, which goes beyond our activity. The job of the Ministry of Communications is that of serving; that is the primary job of the ministry, a semiactivity.

[Question] What is the position of the Ministry of Communications with respect to the expenditures of the ECT [Postal and Telegraph Company] for the UPU [expansion unknown], particularly the 25 million cruzeiros considered surplus or for debatable purposes?

[Answer] The consideration of superfluous expenditures is very subjective. When one has a guest at home what is actually a superfluous expense? Depending on the status of the guest I have to offer him a reception. Costs of that nature are not measured by their absolute value, because they bring with them a profit that cannot be measured. In a congress of 50 days, which brought together nearly 1,500 persons of the level of ministers of state, ambassadors and presidents of large companies, what is actually a superfluous cost? There is a tradition of congresses in the Postal Union.

There were those who said that 450 million cruzeiros were spent and it was established that costs amounted to 140 million cruzeiros. Actually, the problem is that when one has guests and there is the obligation to provide hospitality, to question how that hospitality is provided is to enter into a subjective area.

[Question] How do you define democratization?

[Answer] I believe that it is that rapprochement between the government and the governed, that permanent consultation of public opinion, that desire and that need the country has to be oriented in accordance with the desires and the needs of the people.

[Question] Is there a danger for democratization?

[Answer] I do not believe so. I believe that all that problem, all the difficulties which have occurred, were solved when the government decided to democratize. However, I view some social programs with distrust. The productivity bonus, for example, is something difficult to define. It has been learned through the newspapers that the Sao Paulo metal workers will seek a productivity bonus of 15 percent. There is no country in the world which manages to increase its productivity by 15 percent in one year. No matter how much of a genius the administrator is, when a company is well managed its productivity only increases 1.5 to 2 percent. It is also strange that the productivity bonus is included in wages. Productivity bonuses are variable. If there is no increase in productivity, if there is a decline in productivity, what would happen? A 15-percent growth in a year? Not even with Jesus Christ as administrator.

I believe that we are going to overcome the present crisis. Whenever there is a confrontation, if there is no good sense and judgement on both sides, anything can happen. We hope that the men who are wrestling with the problem are imbued with the sense of the need for a calm, rational and logical attitude with respect to a common denominator because Brazil is not the property of one group, it belongs to all.

[Question] The high echelons of government have spoken with respect to participation by the church. Do you have an opinion?

[Answer] I have a personal opinion. I believe that some persons in the church are straying from its objectives. At a time when the church is an international body, I do not understand how part of it can become involved in the internal politics of a country. The nature of the church is universal and it has a well-defined mission. Actually, what they want is what we all want but there are several ways of presenting, of uttering opinions and of evaluating situations.

[Question] When will the draft of the new telecommunications law be forwarded?

[Answer] The new telecommunications draft bill should be studied by the National Telecommunications Council by the end of the month. It was exhaustively discussed; we received suggestions of all types and we finally decided to divide into two different laws: one refers specifically to public telecommunications and to private telecommunications services, and the other refers to radiobroadcasting because the radiobroadcasting law actually will have a much greater discussion and impact because it involves interests of another nature.

The public telecommunications law contains practices and an experience which we did not have when Law 4.117 was written in 1962-1963. There were practically no public telecommunications in Brazil. All that experience accumulated throughout those 15 or 20 years of public telecommunications services actually allowed us to write a text which conciliates the respective interests of the users and the needs of the companies exploiting the service. Basically, that was what was sought with the new law: inclusion of that which experience and practice has demonstrated to be indispensable.

[Question] Why have the amounts destined for new telephone line contracts this year not been established up to now? Does it not seem to you that those limits and contracts should be fixed long beforehand so as not to prejudice the operations of the companies?

[Answer] The companies are all engaged in negotiations with suppliers. Some contracts have already been established, some are already signed and we shall proceed as much as possible to make new contracts. Actually, that has become so routine that there is not much reason for shouting out that this or that has been contracted for.

We must provide services and not contracts under negotiation. That is always our objective and the number of inaugurations and new accomplishments is significant; however, they do not necessarily always come about. Just recently we approved and authorized a new very low cost switching center to be used in small cities of the interior, and that is being contracted. However, that phase in which a contract in the telecommunications area was a novelty has been overcome. It is now more or less commonplace for us co engage in those matters.

[Question] Does it not seem strange to you that the Federal Government, which spent practically nothing on telecommunications from its own budget, has used the greater part of the National Telecommunications Fund money in other areas of development? Is it not a form of improper use of money which by law were allocated to the telecommunications sector?

[Answer] Actually, the National Telecommunications Fund was specifically created to serve the telecommunications sector. However, there is where we return to the original question: It is up to the government to establish the great national priorities and only the government has the information, only it knows the parameters for effectively deciding which expenditures are of a priority nature. My point of view is very sectorial, and being a sectorial viewpoint, I would like to see all that money spent in the telecommunications sector. On the other hand, when the great needs of the country are seen in the most varied terms possible:

education, health and medical care, we have to agree that the one who is establishing policy guidelines has better information for making decisions than the one who is restricted to his own professional activity. There is always a professional slant. That is inherent in each of us, and within that professional slant, I would like to see all that money spent in the telecommunications sector.

However the development of a country has to be harmonious; it would be no advantage to develop one sector to the detriment of others.

8908
CSO: 5500

BRIEFS

ILLEGAL TV STATIONS PROHIBITED--Brasilia--Some 2,000 television rebroadcasters and retransmitters operating clandestinely in Brazil will have their equipment shut down, starting today, because they have not been cleared with the special telecommunications department of the Communications Ministry. According to the director of DENTEL [National Telecommunications Department], there will be no extensions. Of the 6,000 stations emitting television signals without authorization from the ministry, 800 have registered in the period stipulated by DENTEL, and 400 have requests pending. About 1,200 municipal mayors have asked the ministry about legalizing their stations, fearing pressure from the community if their municipios are deprived of television. The reason behind the registration is that once the stations register with DENTEL, receiving authorization to operate under provisional licensing, these rebroadcasters and retransmitters assume the obligation to pay taxes to the Bank of Brazil at a rate of 1,591 cruzeiros apiece. For stations belonging to the municipal prefects, this rate is reduced by 50 percent. [Text] [Rio de Janeiro JORNAL DO BRASIL in Portuguese 28 Apr 80 p 6] 6362

CSO: 5500

GROUND STATIONS FOR SATELLITE CHOSEN

Jiddah ARAB NEWS in English 3 May 80 p 2

[Text]

RABAT, May 2 (R) — The third general assembly of the Arab Organization for Telecommunications meeting here has decided to site the ground station for the satellite it is due to launch shortly, in Riyadh.

The satellite will handle up to 12,000 inter-Arab telephone and telex calls at once and should cope with the Arab world's telecommunication needs until 1990.

The meeting delayed until later requests by some Arab countries including Morocco that they should provide a site for the relay control, station, which will probably be built by the British Hughes Aircraft Company.

The meeting agreed to requests from Djibouti and Mauritania that they be allowed to join Arabsat, and paid tribute to Iraq for offering to pay Mauritania's membership costs.

The organization also decided to issue a new call for international tenders for the construction of the satellite to be launched by 1982, according to Dr. Ali-Mashat director-general of the organization.

Dr. Al-Mashat said the conditions, but not the specifications of the tender will be changed to enable a larger number of manufacturers to submit tenders. The closing date for the new tenders has not yet been decided pending formulation of the new conditions.

The decision to call for new tenders was taken at the annual general meeting of the organization which ended in Rabat Saturday night, partly because a consortium composed of British Aerospace and Matra and Tom son of France was the only contender in a previous call for bids.

Hughes Aircraft Corp. of the U.S.A. also submitted a tender, but because of objections that it was on the Arab boycott list, its status to be re-examined by the Arab boycott office, which was asked in a resolution of the Arab League general assembly "to take the necessary measures in line with the importance of the Arabsat project," Dr. Al-Mashat said.

CSO: 5500

GULF INFORMATION MINISTERS ARRIVE IN BAGHDAD

Iraq Issues Invitation

JN071905 Baghdad INA in Arabic 1820 GMT 7 May 80

[Text] Baghdad, 7 May--Five Gulf state information ministers arrived in Baghdad this evening to take part in the extraordinary conference that will open here tomorrow. They are Saudi Information Minister Muhammad 'Abduh Yamani, Bahraini Information Minister Tariq al-Mu'ayyad, Qatari Information Minister 'Isa Ghanim al-Kuwari, UAE Information and Culture Minister Ahmad ibn Hamid and Omani Information and Youth Minister 'Abd al-'Aziz ar-Rawwas.

The conference, which is being held at Iraqi invitation, will discuss information issues in the Arab Gulf region and ways of increasing coordination among the Arab Gulf states in the field of information. They will also complete their talks on the topics discussed in the previous two conferences of the Arab Gulf states' ministers, which were held in Riyadh and Doha in January and February.

Hold Closed Meeting

JN071906 Baghdad INA in Arabic 1840 GMT 7 May 80

[Text] Baghdad, 7 May--The Arab Gulf information ministers held a closed meeting in the Al-Mansur Hotel this evening. During the meeting the ministers studied the situation in the Arab Gulf region, as well as the topics on the agenda of their extraordinary conference, which will be held in Baghdad tomorrow. The Arab Gulf information ministers arrived here earlier this evening.

CSO: 5300

BRIEFS

TELEGRAPH LINKS CAIRO, BEN-GURION AIRPORTS--Ben-Gurion Airport--A direct telegraph link between Cairo and Ben-Gurion airports was established on Thursday, and in the first message to pass between the two control towers the employees congratulated each other and promised to cooperate with each other. This link is to serve civil aviation and is usual between the international airports of friendly countries. It has not been established within the framework of the normalization of relations between Israel and Egypt. [Text] [TA080922 Tel Aviv ITIM in Hebrew 0842 GMT 8 May 80]

CSO: 5500

TELECOMMUNICATIONS WILL LINK NATIONS OF REGION

Abu Dhabi EMIRATES NEWS in English 29 Apr 80 p 3

[Text]

Abu Dhabi, April 28 (WAM) The UAE is taking part in talks which began today in Morocco on an Arab satellite project.

Communications Minister Mohammed Saeed Al Mulla, announcing this on Abu Dhabi radio, said "We hope that the project will be launched in 1983. All Arab countries will be linked to each other for information and telecommunications."

The UAE has a station link with the Atlantic satellite and two stations connected to the Indian Ocean satellite (Intelsat IV).

Plans for this year include the installation of a cable between the UAE, Qatar and Bahrain, as already agreed upon. "We hope that in the future this will be extended to Kuwait and also Iraq," the Minister said. "This should be see direct links with more countries."

"The UAE is ready to start automatic dialling when the traffic demands it and we find it reasonable and commercially viable."

Following the recent visit of the Pakistani Minister of Communications, Ghulam Mohiud Din Baloch, there are immediate plans for a semi-automatic dialling system between Pakistan and the UAE. This should take three months, and the system will be made fully automatic later.

Reviewing telephone facilities in the UAE, Mulla said that until 1976, there were several telephone companies in the country, including the Abu Dhabi Telephone Company, Sharjah, Telephone Company and the Fujeirah Telephone Company for local calls, and cable and wireless for informational calls.

In 1976 Emirtel was formed and 32,000 telephone lines installed.

"Now," said Mulla, "we have 180,000 lines and we expect 43,000 more to be installed in the next year, which will bring the total to 223,000 lines."

Direct international links began after the earth stations were built at Jebel Ali in Dubai, Bada Hamama in Abu Dhabi, and in Ras Al Khaimah. Now the UAE is connected to 26 countries.

The most exciting plan for the 1980s is the installation of an exchange to provide mobile telephones by mid-1981. "The exchange will provide 5,000 lines to cover the whole of the UAE," the Minister said.

The range will stretch from Sila in the west to Khor Fakkan in the east.

Of postal services in the UAE Mulla pointed out that it is difficult to keep pace with the continual increase in mail. "Now it's not bad, but it's not good either," he commented.

There was an improvement last year after the new Dubai general post office became operations. There are plans for new general post office buildings in Sharjah and Ras Al Khaimah.

"After we have these, the postal service will be improved," the Minister said, but "we need more staff."

In the new budget allocations for this year, the Communications Minister has pressed for more staff for the postal services and the Ministry this year's budget is about the same as last year's. This is apart from the large budget for roads – a responsibility of the Communications Ministry but built by the Ministry of Public Works and Housing.

A telecommunications training school has been set up by the Communications Ministry in Sharjah, where nationals are trained. However, the Minister said there are "not yet sufficient local people," working in telecommunications. Some are trained in the United States, Britain and other Arab countries.

And the target for 1985?

"Communications in the UAE have changed and improved a lot," Mulla said. "We are looking forward to providing good facilities to cover every village in the UAE. We hope that will be in 1985."

CSO: 5500

PROGRESS NOTED ON FRANCO-GERMAN DIRECT TV SATELLITE

Paris LE NOUVEL ECONOMISTE in French 28 Apr 80 pp 53-53

[Article by Philippe Gazier]

[Text] The green light has been given to the Franco-German direct TV satellite program: the agreement for cooperation between the two governments is now settled and is to be signed within the next few days.

Of course, the principle of this cooperation had been agreed upon since the Franco-German "summits" of October 1979 and February 1980. But the industrial organization of the operation proved to be delicate. On the French side, it concerned the Aerospatiale and Thomson-CSF; on the German side, the companies involved are Messerschmidt-Bolkow-Blohm (MBB) and AEG-Telefunken.

In the final analysis, Federal Germany will have a slight edge during the "pre-operational" phase (placing into orbit 2 satellites by means of Ariane in 1984 and availability of a reserve satellite on the ground). Actually, Federal Germany will assume 54 percent of the industrial load, as compared with 46 percent for France, who to be sure, is already heavily loaded with the Ariane program. The financing of the operation, estimated at 500 million Deutsche Marks, that is, a little less than 1.2 billion francs, will be assumed on a strictly equal basis.

"On a long term basis, the agreement is based on the principle of balanced return between the two countries", says Mr Philippe Esper, interministerial delegate for audiovisual techniques. But would there be place in these circumstances for a third country, Belgium, of which one of the companies is a member of the Eurosatellite group, besides the four French and German industrialists? Mr Esper answered: "We wished to end our discussions on clear terms, and the decisions concerned only France and Federal Germany. But this does not exclude a future extension to a third country."

It was high time for the "Franco-German tandem" to put an end to its hesitations. For the Americans and Japanese are showing increasing interest in direct television. Mr Christian Loeffler, a Thomson-CSF director comments: "We would be the first to benefit by a reference."

Mr Pierre Usunier, Aerospatiale director asserts: "We are convinced that there will be a vast export market: we estimate the latter in dozens of systems, each with three satellites. China, the Luxemburg and the Scandinavian countries are already keenly interested. Many other countries will have major reasons to be interested in it."

It only remains now to release the funds needed. On the French side, the industrials estimate that they will need about 35 million francs from now to the end of 1980.

9018
CSO: 5500

TELECOMMUNICATIONS DIRECTOR GENERAL THERY INTERVIEWED

Paris L'USINE NOUVELLE in French 7 Feb 80 pp 62-63

[Article by Eric Le Boucher: "Gerard Thery: 'Encourage the New Technologies Systematically'"]

[Text] [Question] The change in equipment technology following the changeover to time switching is causing the industrial cards to be dealt again. Can you define the French position?

Gerard Thery. The privileged relations between countries and manufacturers are being modified in favor of the enterprises and nations which have turned the technological corner in time. France and its industrialists did so. In France the first time-switching exchanges became operative in 1970. Since that time French industry has developed new, efficient and competitive equipment, especially the E 10 of CIT and the MT of Thomson. By the end of 1979, 750,000 time-switching lines had been installed in France, and 1,800,000 were on order. Of some 9 million time-switching lines installed or on order in the world, 3,500,000 (40 percent) are of French technology.

In 1979 alone, French equipment (such as the MT and E 10) was ordered by some 15 countries, in particular by several countries in which French industry had not yet really taken root. The sum total of these orders amounted to about 1.7 billion francs, i.e. 5 times more than the preceding year. This is a highly positive result. I should add that we are holding on to a technological advantage of 2 to 3 years.

[Question] You encourage industrialists to export, but your policy is more comprehensive since you rely also on automatic data transmission.

[Answer] Exports are necessary. Remember that the French industry is an outsider industry since, until recent times, its exports amounted to only 10 percent. Today this figure has risen to 18 percent and, in consideration of recent results, I believe that the goal of 30 percent in 1982 will be achieved. But this is not sufficient, and we must reach 50 percent by 1985-1987.

There is no doubt that automatic data transmission will be an important factor. Therefore our technological advance must be equal in most fields. Consequently we are initiating a systematic and completely voluntary policy to promote new technologies and services. This applies to satellites with Telecom 1 and optical fibers with which a videophonic service will be opened to the public at Biarritz in 1983. I must add that as soon as possible an optical-fiber submarine cable will be laid, and a Paris-Lyon-Marseilles optical-fiber link will be opened.

[Question] Yes, but French firms have not yet reached the international stature consistent with these ambitions. For example they have little interest in the United States, which represents 50 percent of the world market. Have they waited too long?

[Answer] In Europe, public markets are still predominant, but they will decline. In the second place, the international situation is evolving toward the opening of American markets, and also of European markets. Therefore, the era of dependence of industrialists upon their administrations is completely over. I say this emphatically. This means that the specifications defined by the Administration must be flexible and adapted to exports. We have been practicing this policy for more than 3 years.

On the other hand this means that the industrialists must develop marketing teams. I am positive: those who will not do so are doomed to disappear or sell out. Therefore, like the others, the American market must be of interest to industrialists. The Office of the Director General for Telecommunications has opened in New York an agency--France Telecoms--to assist industrialists in the penetration of this market. I think it is high time.

[Question] The DGT (Office of the Director General for Telecommunications) has just revised its purchase prices. How far can you go without jeopardizing the self-financing capacity of enterprises, and thus hamper their research and development?

[Answer] Although essential to the development of the country, the industry has been subject to many levies. The policy of the government consists in modifying this state of affairs to improve the self-financing of enterprises. This is the essential point. But there is still the question of prices. I do not believe in the necessity of overpaying for equipment since this situation will not endure in the face of the opening of borders. On the contrary, it would damage French industry. On the other hand we shall support, with our own resources, the new technologies such as the Telecopier, which provides a new service for the user and also generates traffic for us.

[Question] But is it not contradictory to ask industrialists to market products which are not really their own?

[Answer] The paradox is only apparent. Marketing is indispensable. Firms must anticipate future markets. The Telecopier and the Videotex will have a broad public market, as has been the case with the pocket calculator. I am not interested in knowing whether the markets will be in the field of automatic data transmission (plug-in equipment) or of private systems (independent equipment). It is a discussion of ideas which appears totally unproductive to me. Some myths must be exorcized, and we must have a completely systematic and voluntaristic attitude, which is exactly what the Japanese have done.

Therefore I am quite open to dynamic enterprises, especially the small ones. We are ready to help the industrialists who have knowhow, or simple or ambitious ideas on any level, from keyboards through connection techniques to wiring.

9456
CSO: 5500

FIGHT HEATING UP FOR TELECOMMUNICATIONS MARKETS

Paris L'USINE NOUVELLE in French 7 Feb 80 pp 58-65

[Article: "Telecommunications: the Market War"]

[Text] Geneva. The Telecom 79 international exhibition has received 165,000 visitors, 60 percent more than the previous exhibition in 1975. "A brilliant success." It may be surprising that the telephone attracts so many people. But understanding comes quickly: the market is exploding.

The United States, Sweden, and Switzerland already have more than 60 telephones per 100 inhabitants, while the world average is hardly 15. According to Arthur D. Little's consulting agency this figure will treble by the year 2000, and the number of lines will reach 1.4 billion. Market forecast: 1,000 billion dollars. Industrialists are jostling for position at the starting line.

But this is not all. When the market explodes the technologies change altogether. The electromechanical era has definitely gone by and the electronic telephone has prevailed. It is less costly, more reliable, and in particular opens the door for automatic data transmission. The stake is stupendous: behind the equipment involved in the television set and the telephone line on display at the Geneva exhibition, the greatest industrial revolution since the end of the 19th century is taking shape.

The grey handpiece with its round dial used by 14 million French families amounted to the enormous sum of 130 billion francs in the period between 1976 and 1980: 26 billion per year. In the 90s the American automatic data transmission industry will pick up a minimum of 1,500 billion a year. The scale is changing.

The introduction of electronics in telecommunications is also reshuffling the industrial cards. Those who understood first that the computer would be introduced into telephone switches (call-line finder centers), and who took the jump, are ahead. Those who preferred to amortize the old technology over a longer period have missed the bus. Now they are working twice as fast, but are gradually losing decisive markets. France--once makes things no habit--is among the first.

To understand this we must go back to 1975. It was then that the French telephone technology took a great leap, and consideration was given to making wholly French the industry which, aside from CIT-Alcatel, a subsidiary of CGE, is 60 percent in the hands of the multinational firms ITT and LM Ericsson. During the same period the team of Gerard Thery, director general for telecommunications, and Jean-Pierre Souviron, director of Industrial and International Affairs (DAII) at the Ministry of Posts, Telegraphs and Telephones (PTT) decided to utilize the most modern equipment. Calls for bids, eliminations, repurchases: the "telephone affair" will be played soon.

Thomson-CSF, which was designated to step in, is recovering LMT from ITT and Francaise des Telephones from Ericsson for 1 billion francs. It will manufacture, under license, space switches which are a hybrid technological compromise between the electromechanical crossbar and the future all-electronic time-switching system. But just by luck Thomson has discovered a time-switching system prototype, the MT 20, at the bottom of the drawer at LMT, and is developing it at the request of the Administration.

For its part, CIT-Alcatel had already inherited in the 60s a time-switching exchange, the E 10, developed at the National Center for Telecommunications Studies (CNET). CIT hesitated for a long time, but it is developing the E 10 under the pressure of the supervisory administration, which is accelerating the substitution of electronic systems for crossbars with its orders.

Therefore France is ahead of its competitors. Perhaps too far ahead. Have they re-invented the Concorde? All the large export business escapes the French industry. French industrialists, habitually confined to operating in France, are totally unaware of export practices. Their faith is not very strong, and they have observed that "the free world market constitutes only 10 percent of the total, and that the share of the time switching exchange in it is marginal: about 10 percent."

Compared to the 2.8 billion lines in the domestic market, exports are stagnating and do not exceed 10-11 percent according to the Telephone and Telegraph Industries Union, while the Administration is aiming at 30 percent.

Foreign industrialists systematically grab the big contracts. The situation is clear: Saudi Arabia (15 billion francs) has chosen Philips-Ericsson; South Korea (2.5 billion), Taiwan (1 billion), and Algeria (1 billion) preferred ITT, and finally at the end of 1979 Brazil (1 billion) chose ITT and Ericsson.

Little by little, CIT-Alcatel has nevertheless made several breakthroughs: Poland (as early as 1972), North Yemen, Malta, Sri Lanka...and some African countries. On the other hand, Thomson has not moved ahead: in late 1978, of the 2.4 billion for switching system orders, only 8 percent involved exports.

Everything speeded up in 1979. Orders for time-switching systems on world markets jumped from 12 to 20 percent. France wished to take advantage of this. Telecom 79 served this purpose. The French stands were better located and it was impossible to avoid walking through them. Of the 600 exhibitors from 40 countries the French had come in force: 61 firms rented stands, besides the sumptuous PTT stand.

But this advertising effort would have moved only a few people if a few telex messages had not come at the right time. Three African countries, Benin, Mali and Niger placed orders with Thomson-CSF: 25 million francs for their international transit exchange. On the same day, 24 September 1979, Colombia made the same decision and added an order for a French telecommunications-satellite land station. But all this was insignificant. The miracle had come the previous week when Egypt decided against all expectations to assign the development of its telephone network to the Siemens-Thomson-CSF European partnership, and the French group is to rake in one-fourth of the plum, i.e. 1.8 billion francs over 5 years. With these 3 orders a total of about 15 countries were lured by the Thomson-CSF telephone in 1979.

CIT-Alcatel assumed a fastidious attitude toward its young competitor even when a contract of 310 million francs for Greece was announced during the same period, and yet the CGE subsidiary stresses its progress. It is true that it was done out of the Egyptian contract when everybody thought that it was in a better position than Thomson, but it declared calmly that it still held 60 percent of the total number of time-switching lines installed in the world. "Our rise to exports is very progressive: 22 percent in 1979, and we shall reach 27 percent in 1980."

CGCT, the remaining ITT subsidiary in France, which was still the first French telecommunications exporter in 1978, experienced other successes, especially in Brazil and Argentina, with the help of the world network of the parent firm. But it is impeded by the regression of ITT activities in the United States and remains dependent on its favor in supporting one of its European subsidiaries.

The third French enterprise, SAT, which specializes in transmission, conducts almost 25 percent of its sales, including indirect sales, on the export market. In Colombia it has obtained a contract for a numerical multiplex system (50 million francs) in competition with four foreign firms. "It is a sign of our advance in numerical technologies."

Therefore the French advance does not apply only to switching--where, according to PTT, orders in 1979 multiplied by 5 in comparison to the previous year and amount to about 1.7 billion francs--but also to transmission, at least to some numerical transmission equipment. Besides switches for submarine, land, and soon optical cables and various connection equipment, the telecommunications market is also based on a very large complex, satellite radio towers, and line terminals (telex and private switchboards).

Very Tightly Closed Markets

There is an increasing tendency to sell complete packages, but very few manufacturers, possibly only one, Western Electric, a subsidiary of American Telephone and Telegraph (ATT), are capable of doing it by themselves. Although associations are born, small enterprises still sometimes avail themselves of the situation, such as the cable manufacturers Acome and Halberthal who specialize in intercom systems.

In consideration of the 1979 upturn, PTT maintains that the 30 percent goal in the export turnover of the trade will be reached in 1980, and aims at 50 percent for 1985-1987. Is the bet won? Far from it. The stated goal is yet to be reached. "In this profession you can't live off 'killings,' in spite of the publicity they get, but on a less spectacular steady rate of business. Our really brilliant killings have not yet been developed," explained one industrialist.

Telecommunications markets are more or less protected. For example, European countries reserved for national industries are closed to outsiders. Third countries or multinational enterprises established locally, sometimes with plants, using all possible arguments to receive new bids, can be considered as semiclosed. Theoretically, only brand new countries without an existing telephone infrastructure would be open. There is, of course, no such country.

Two Big Markets: Two Broad Strategies

Second evident observation: the accessible markets are of different sizes. Nigeria alone accounts for 56 percent of the forecast for black Africa for the next 10 years: 5.2 billion dollars. The acquisition of a market in Benin, as done by Thomson, is a positive act, but from now until 1990 this country should account for only 25.5 million dollars, i.e. five-thousandths of the Nigeria figure.

In view of these two observations the French strategy is simple: approach the markets of the Third World with time-switching systems, and the markets of the developed countries with automatic data transmission terminals. Depending on the economic level of the country there are two distinct markets, therefore two types of commercial forces, i.e., two tactics. This is elementary, but starting from almost nothing, as was the case of France, the struggle is longer.

The first brick of this strategy is the time switch with the developing countries as primary market. Among the most interesting are the nouveaux riches of oil. The Saudi Arabia market has been called the "contract of the century," but this applies also to Iran prior to the Islamic Revolution, the Gulf countries and Nigeria. Then come the countries which have semi-industrialized, such as South Korea, Mexico, Singapore, and Southeast Asia generally which should take over from the Middle East in the big contracts. We should add the countries whose markets are inducers of dreams: India, China and the countries of the East. We must finally include the developed countries without a national industry: Greece, Ireland, Australia, South Africa, etc.

This first category constitutes 15-25 percent of the approximately 350 billion dollars for world investments anticipated for the 1980's. The computation is simple. At $1000 per line (including buildings, line laying, etc) the result is between 5 and 9 million lines a year. This is the aim of the French challengers.

"Since mid-1978," explained Charlie Garrigues, assistant director for international activities at DAII, "these third countries have been calling for a large number of bids after reconsideration of their policy. Now they want time-switching lines, a field where France is ahead." Brazil and Argentina are exceptions since they have decided on the space switching system under the pressure of the predominant international-level manufacturers.

These manufacturers see with a jaundiced eye the coming of new challengers already in possession of equipment which they will have ready only in 1 or 2 years. In the 60's, 3 large firms with the crossbar technology have shared the world. They are:

--ITT (International Telephone and Telegraph), the archetypical multinational firm, with 1,000 companies in 70 countries, 400,000 employees, a turnover of 15.3 billion dollars, 30 percent of which is in telecommunications, or 25 percent of the market concerned.

--Siemens: 322,000 employees, 67 billion francs in 1978, of which a little less than one-fourth in telecommunications, 73 plants outside Germany, and 44 additional plants in which Siemens holds more than 50 percent of the stock.

--LM Ericsson: 65,000 employees, of whom 38,000 are outside Sweden, 2 billion francs in 1978, of which more than 85 percent was in telecommunications. Excellent reputation with operations in more than 100 countries--20 plants outside Sweden: 47 percent of its sales are to the Third World. Ericsson maintains that it holds 96 percent of the Australian market, 30 percent of the African market, and 45 percent of the Latin-American market.

After these three big ones there are:

--Philips, number 2 in world electronics. This multinational firm devotes only 7 percent to telecommunications, and holds 7 percent of the market.

GEC and Plessey. The British still hold 7 percent of the market, most of it in Her Majesty's former colonies. GEC earned 2.7 billion pounds in 1978, of which less than 20 percent was in telecommunications.

The rest of the market is divided among the U.S. Western Electric, GTE, Continental Telephone, etc., the Canadian Northern Telecom, the Japanese Hitachi, Fujitsu, and especially NEC which account for 15-20 percent, and small local industries.

What place is left for the French? That is the question. Is the breach opened by technological renewal just a small crack? "France has had its opportunities," explained Martyn Roetter, European expert for Arthur D. Little, "but it must not overlook its current chances. When one or two industrialists have been chosen, the situation is once again held up for several years." In fact, the firms which have obtained a new market or, better yet, a local industrial installation, use every possible means to explain how very costly it becomes to change the standards and the program softwear.

"Perhaps it is not logical, but in general, each country limits itself to one or two manufacturers," continued Martyn Roetter, "especially for subscriber exchanges. Transit exchanges can be sold more easily on an individual basis." This difference is essential if one considers that until recently only Thomson-CSF had a transit exchange, the MT 20. The 15 or so countries where they have been sold are probably, under these circumstances, far from being reliable markets.

Conversely, the E 10 of CIT-Alcatel is a subscriber exchange which can not be sold individually. This would explain its difficulties, since for technical reasons the time-switching market is more advanced in transit systems than in subscriber systems. If this hypothesis is correct, then CNET made a strategic error and CIT waited too long, since the E 12, the transit exchange, is ready only today. Thomson, for its part, is improving the MT 25 subscriber exchange for 1981. In fact, the explanation is inadequate. Technical advance is not everything. Contracts are won only by a mixture that includes technology, of course, but also politics, financing and cost.

Politics, obviously, since telecommunications equipment is part of strategic equipment and is sold, not to private customers, but to governments (The PTT's are state-owned everywhere except in the United States and Finland.)

Thus, "the minister travels a great deal," admitted Gerard Dega, of the office of Norbert Segard who, we remember, is the former minister of foreign trade. The government throws all its weight into the battle. "This is indispensable, since in the capacity of operators, we can provide helpful advice to our foreign counterparts." Various organizations--SOFRECOM (French Company for Research and Manufacture of Telecommunications Equipment), France Cable Radio and SONERCO [expansion unknown], which is being set up--of French experts are making studies for the PTT's of the third world.

As a GIE [Economic Interest Group] for telecommunications engineering between the administration and the industrialists headed by Francois Barre, SONERCO is, to tell the truth, an old project of Jean-Pierre Souviron, the director general of industry in the Ministry of Industry, and is a project which is experiencing development problems because industrialists fear too much interference in their trade policy.

Financing is, most likely, the biggest problem. Thus, Siemens-Thomson won the Egyptian contract because [it provided] complete financing at a rate of 5.5 percent a year for 15 years, and no payment for the first 5 years. "At that price, it was impossible for the Egyptian Government to refuse," noted the competing American consortium (Western Electric, GTE and Continental Telephone.)

The conditions for financing are, moreover, still raising problems for Bonn and Paris, where they are still attempting to find ways to provide funding....

In France, except for the Egyptian case, other difficulties must be overcome, it is recognized, both by the PTT and by the industrialists, and in particular by the small and medium-size businesses. Agreement between individual countries are reserved for large contracts and the purchasing country decides. Thus it happens that military matters are given priority. COFACE (French Foreign Trade Insurance Company) occasionally hesitates about small contracts since its officials still do not understand the effect of the openings made by the first telecommunications contracts.

French Bids at Competitive Prices From Now On

But it is the medium-size contracts, from 50 million to 100 million francs, that go through the most difficulties. In France, there is no way to cover them. Thus, the International Monetary Fund which, as is known, closely supervises countries' investment policies, requires 10 year financing...while COFACE financing can not exceed 8 years. "These gaps," the people at the PTT admit, "have caused us to lose some business. However, on the whole, things are improving." No doubt, but quick action is required before the opening closes again....

French industrialists are currently making bids at competitive prices. This was not the case just 2 years ago, when they were usually 30 percent higher than the others. The threat is now coming from Japan. Japanese industrialists are now selling at half price. Like the French, they are outsiders about exports. Sales in the Japanese domestic market (30 million lines installed) are falling. To keep their factories busy, Japanese industrialists are selling off their spacial lines at 150 dollars, as compared with 250 dollars to 300 dollars on the world market.

Dumping? What does it matter, since anything goes, and the pugnacity of the Japanese electronics industry is well-known. Curiously, this danger is not clearly understood in France. Electronics for the general public, as well as components and computers testify to it (See "The Secrets of Japanese Electronics," issues 42, 45, 46 and 49 of 1979 and issue 1 of 1980.) Thus, the Japanese will most likely obtain a large share of the contracts in 1980. People are already talking of Chile, Argentina and especially India, countries where they have a clear advantage.

Will Exports Only Compensate for the Drop in the Domestic Market?

Under these very difficult export conditions, when talks last for years (the contract that Thomson signed with the Soviet Union dates back more than 8 years, to the time when LMT was an ITT subsidiary), when politics plays a preponderant role (contracts sometimes negotiated with weapons contracts) and bribes are standard practice, where does French industry stand?

Technological advance remains a great advantage. The time-switching equipment of Siemens and the British System X, which have been discussed for years (English firms are still proposing the "stronger" technology which preceded the crossbar!), only exist as prototypes; Western Electric, by far the largest firm in the world but limited for 50 years to the American domestic market, apparently only offers transit exchanges for export and has not yet made all its weight felt in the battle. However, all these firms are catching up. Ericsson has already succeeded and ITT is about to.

Two years from now at most, all will produce time-switching equipment, which for some will already be the second generation, using almost completely integrated electronic circuits. In France, the equivalent can not be produced until much later, around 1983-1985! That is the first problem. Then too, it should not be forgotten that the French industrialists are not the only outsiders: Northern Telecom, the Japanese and even the Italians are currently developing very ambitious policies.

It is also true that the French firms have delayed in becoming true multinationals; their trade networks are new and formed by Frenchmen while ITT, Ericsson and Siemens have been established for a long time and know perfectly well how to blend in on the local scene. It is also true that the internal Thomson-CGE struggle which, if "it has not made it lose the market," according to Jean Syrota, the DAII successor to Jean-Pierre Souviron, nevertheless halves the benefits of size and doubles the immense costs of research and development (from 10 to 15 percent of the turnover.) There is also the employment problem caused by the accelerated changeover to electronics (an excess of 15,000 to 20,000 jobs out of 90,000) which weigh heavily on cash flows and thus, on the investment abilities of French firms.

The calculation is then simple: of the 5 to 9 million lines per year which are "up for grabs," France can hope for 15 percent, or at most 1.3 million. Compared with the 3 million lines of the French market, this represents the 30 percent which is the target of the administration. This will increase when domestic orders fall as the French backlog is removed. However, it could happen then that exports will only compensate for the drop in domestic orders! That, at least, is the fear that many industrialists share with the trade unions.

Even if these fears are general and if French industrialists can hope for a larger share of the various telecommunications sub-markets; even if some countries like China grow more quickly than expected, it is clear that this calculation shows the urgent need for exports, its problems and its limitations. Next, it shows a certainty--there are too many firms. "Like the automobile at present," stressed Alain Le Bihan, the director of the Thomson-CSF telephone switching system, "we see the same disappearances and the same regroupings." In conclusion, he pointed out a mistake of French firms; they did not enter the United States market soon enough.

While this country is certainly 85 percent covered by AT&T (Bell System) and by other groups like General Telephone and Electronics, of lesser importance, nevertheless very powerful on the American scale, it has been opening up progressively since 1968. The Japanese NEC [expansion unknown] and the Canadian Northern Telecom understood this and immediately established themselves there to sell switches, even to AT&T.

Certainly, SAT has agreements, Jeumont-Schneider and small firms like Halberthal are achieving success, but this remains marginal. CIT-Alcatel seems to have realized this is 1979 and, moreover, is obtaining good results. At the present time, neither of the two large French firms has established itself with the necessary ambition in the United States.

Should we be pessimistic? No, because there is automatic data transmission which is the second axis of the strategy. Thus, it is urgent to launch into it. The general directorate of telecommunications is repeating, here, the wager made on time-switching systems which, despite their limits, is about to succeed. It means skipping a technological-commercial stage to prepare the 1982-1983 markets, and eventually help to create them. Gerard Thery is betting on optical fibers, satellites, domestic terminals such as the videotex or the telecopier, and he is urging the telecommunications industrialists to make them and sell them on the domestic market. He is also opening competition to newcomers like Matra, Dassault, Saint-Gobain-Pont-a-Mousson, Jeumont-Schneider, Sagem and many small and medium industries. The gaps in the structure of French industry must be filled in. Quickly, too, for the competitors are many for the automatic data transmission markets.

The commutation and the transmission represents grosso modo the two market levels. This part should remain stable, but the geographic distribution should change: the markets are concerned more and more with developing countries. In contrast, the developed countries are turning toward terminals, mobile radios, private telephones, and especially telematique which should be on the market after 1985.

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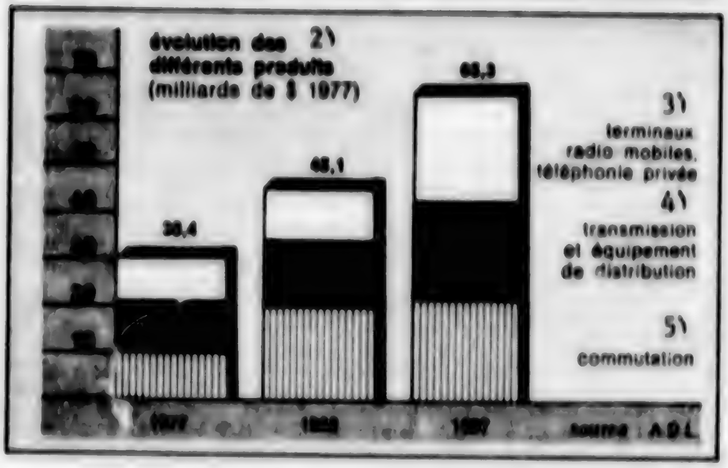
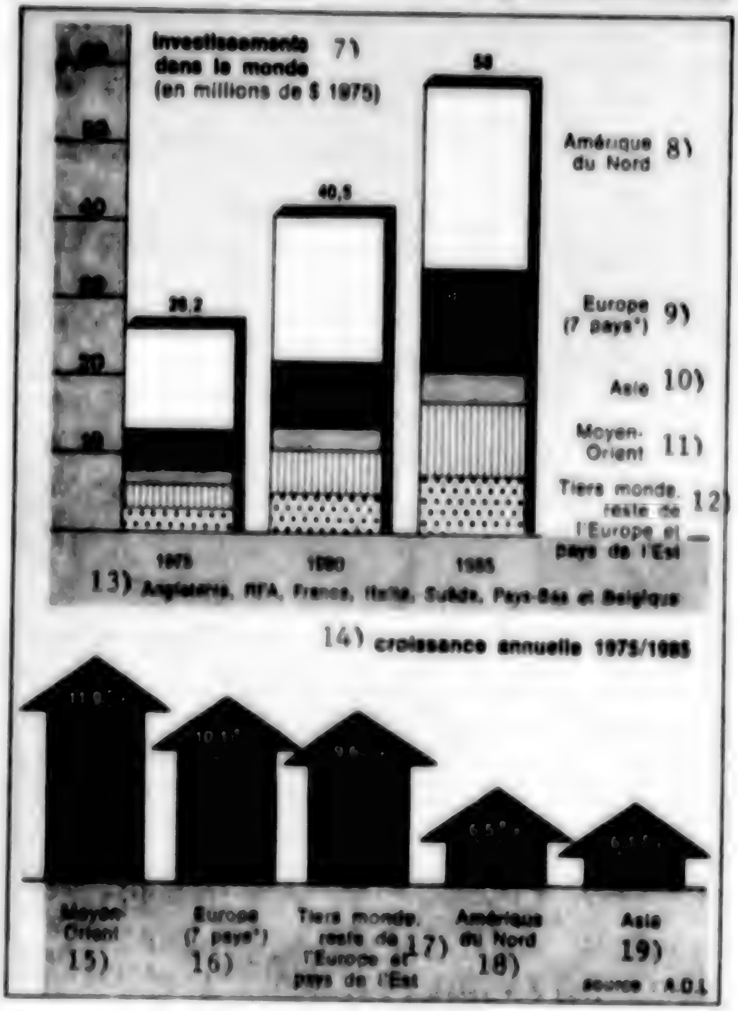
JUSQU EN 1987



The North American market is the largest: 47 percent of the world total. Nevertheless, the highly-elevated rate of equipment attained in the United States and in Canada causes us to predict a smaller than average increase. The telematique equipment is on the upswing.

6) L AMERIQUE
PREMIER MARCHE



The World Telecommunications Market

Key:

1. More than 7 to 8 percent a year until 1987
2. Evolution of the various products (billions of dollars 1977)
3. Terminals, mobile radios, private telephones
4. Transmission and distribution equipment
5. Switching systems
6. America, the largest market
7. Investments in the world (in millions of 1975 dollars)
8. North America
9. Europe (England, West Germany, France, Italy, Sweden, the Netherlands and Belgium)
10. Asia
11. Middle East
12. Third World, the rest of Europe and the countries of the Orient
13. England, West Germany, France, Italy, Sweden, the Netherlands and Belgium
14. Annual growth 1975/1985
15. Middle East
16. Europe (England, West Germany, France, Italy, Sweden, the Netherlands and Belgium)
17. Third World, the rest of Europe and the countries of the Orient
18. North America
19. Asia

Bids for 1980
(amounts estimated in millions of francs)

ASIA		
South Korea	1,500	
India	160	(and possibly much more)
Philippines	200	(transmission)
Malaysia	1,000	
Singapore	550	to 750 plus 110 (transmission)
Thailand	250	to 300
AFRICA		
Algeria	120	plus 500 (transmission)
Gabon	90	
Madagascar	110	(transmission)
Tunisia	200	
Nigeria	2,700	(transmission)
LATIN AMERICA		
Argentina	1,000	to 1,500
Brazil	1,200	(transmission)
Chile	300	
Colombia	200	plus 120 (transmission)
Costa Rica	200	
Mexico	250	per year for 10 years
Peru	200	
El Salvador	100	
Uruguay	200	
Venezuela	500	to 600 per year for 3 years
Brazil-Senegal-Portugal	1,000	(transmission cable)
MIDDLE EAST		
Iraq	700	plus 570 (transmission)
Jordan	290	
Lebanon	200	
Kuwait	40	(transmission)
Libya-Italy	120	(transmission cable)
Syria	100	(transmission)
Syria-Greece	100	(transmission cable)
North Yemen	90	(transmission)
EUROPE		
Greece	100	plus 270 (transmission)
Ireland	100	(possibly more)
Romania	150	to 250
Norway	7	to 35 (telex)
USSR	80	(transmission)
Yugoslavia	100	(transmission)

The Thirteen Largest Firms
90 Percent of the World's Production

	Turnover 1978 Telecom.	Turnover Percentage of Country's Industry	Percent of Overall World Market
Western Electric (United States)	37,000	85	23
ITT (United States)	22,600	--	15.3
GTE (United States)	18,060*	8	14
Siemens (West Germany)	12,500	20	8.3
Hitachi (Japan)	8,000	--	5.6
Ericsson (Sweden)	7,600	77	4.7
Thomson-CSF (France)	6,000	43	3.8
Northern Telecom (Canada)	5,375*	100	4.2
CGE (France)	5,000	21	2.5
Philips (the Netherlands)	3,600	--	2.5
GEC (Great Britain)	3,000	2	2
Nippon Electric NEC (Japan)	2,750*	40	2.1
Plessey (Great Britain)	1,720*	1.2	1.3

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*1977 figures

Source: Arthur D. Little and "The New Factory"

"Triple-C" Firms Will Win

The expertise of the telecommunicators pales before that of the electronics experts (for integrated circuits) and that of the information specialist (for the softwear to apply to computers and microprocessors). Already the factories for exchanges resemble, assembly line for assembly line, those for computers. Softwear will soon represent half of the added value. The integrated circuits peculiar to telecommunications will take up most of the other half. Now they are being massed produced in the United States by RCA, Texas Instruments or Motorola, at prices lower than those the French industrialist can offer.

"The triple-C firms will win," they say at Siemens--computers, communications and components. This is also the slogan of the Japanese. The Americans draw their strength from this. AT&T has just reorganized from top to bottom to deal with the challenge and has started a 13.7 billion dollar investment program, 5 times the turnover of all French firms combined.

The French want to play their cards proudly in the fabulous markets which are opening. There is room for everyone, but the battle will be fierce.

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PLANNED MODERNIZATION OF TELECOMMUNICATIONS NET DESCRIBED

Stockholm TELE in Swedish No 1, 1980 pp 1-14

[Article by Carl Wahlén, head of the department of telecommunications net planning; Gunilla Brolin, office of net optimization, domestic telephone net section (Ni); and Olof Söderberg, head of the planning section (Np), all of the central administration of the telecommunications service.]

> [Text] The telecommunications net will undergo a comprehensive modernization in the next few decades. Digital technology will gradually replace analog technology, although that is a long-term development. Economic considerations and market demand will play an important part in determining how and at what rate the modernization and expansion are carried out.

The telecommunications net is defined here as the whole of the physical facilities required to transmit all kinds of information from one place to another. The telecommunications net thus includes data, alarm, radio, telephone, telegraph, television, telex, and video nets for both public and private use.

The reflections presented below, however, are based in the main on the data, telephone, and telex nets, which dominate the publicly accessible information transmission sector. The reflections, however, should be of general validity.

The article concludes with a summary of the principles for expansion of the traffic apparatus, which were established by the board of directors of the telecommunications service in November 1979 as a basis for continued planning both within the telephone areas and at the center.

The article does not describe the new technology that is available or is foreseen for a future time. That sector has been discussed and documented --in this journal and elsewhere--to an extent that renders repetition unnecessary. Nor does it discuss the demand analysis problems, which may be considered as being the hardest to get a grip on. The article is intended to throw light on what problems there are when it comes to modernizing the telecommunications net on the basis of technology and economics and with a view to satisfying possible demands.

Modernization Strategy

By strategy is meant the pattern of action and the guidelines that are contained in an overall plan for long-term planning, to attain established goals and to coordinate the utilization of all resources. The telecommunications service's strategic planning is therefore the result of the policy that the management of the service sets to be able to attain the twofold objective of providing a modern telecommunications net at the lowest possible price.

To create anything newer and better there has to be a need for improvement. The need can be both physical and psychic. It need not consist in demand for new services, but can be and often is a striving to provide existing services at lower cost or perhaps to satisfy the need to be able at all times to take pride in or boast of being the one that has the most modern thing there is.

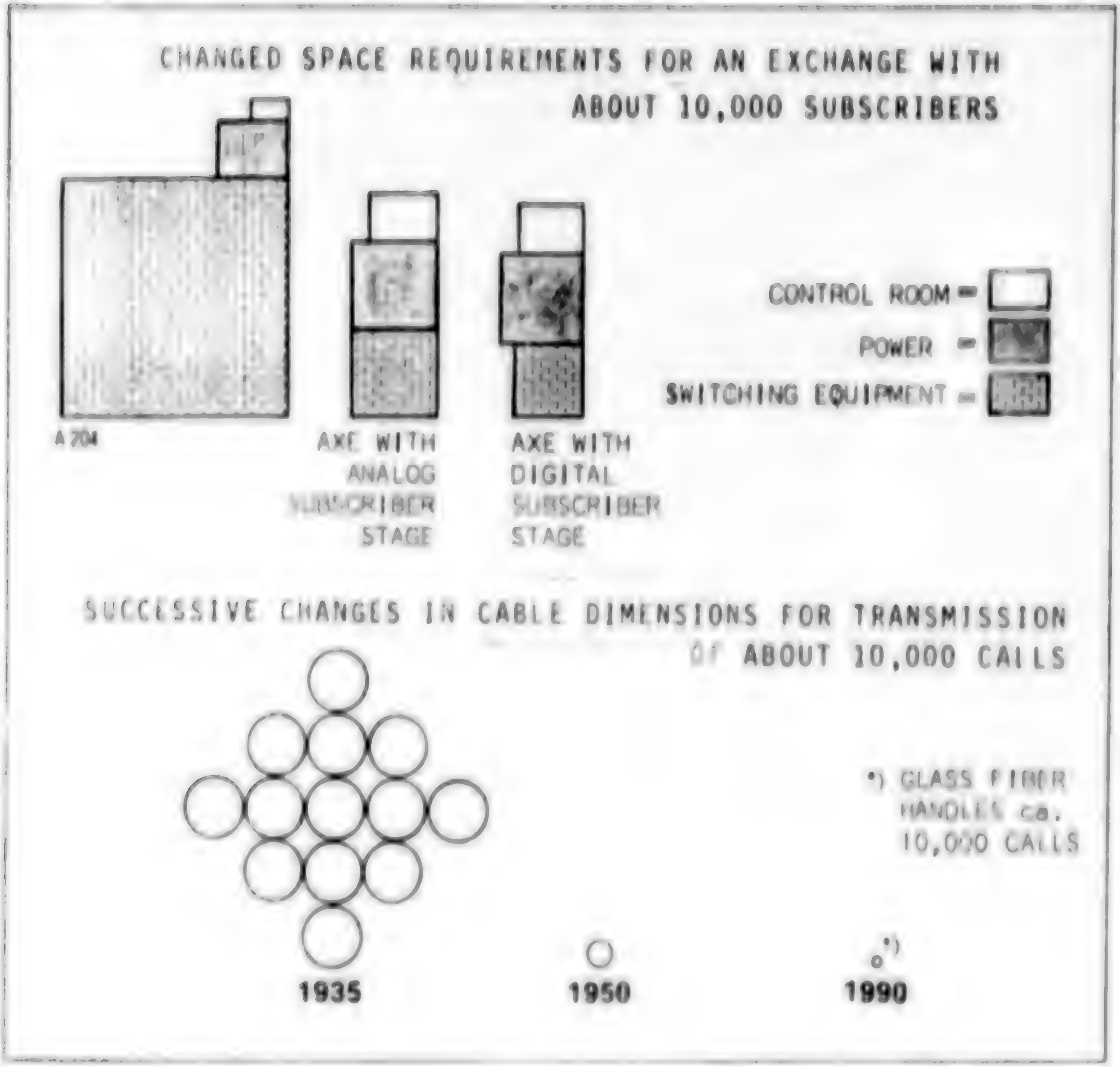
Man's needs are thus certainly immeasurable. The hierarchy of need undoubtedly has as many steps as Jacob's ladder. New needs create additional needs at an ever-accelerating rate. The willingness to make sacrifices, to pay for satisfaction of needs, drives the development ever further and creates resources to invest in new facilities.

Need, technology, and economics thus give rise to modernization. Within the Swedish telecommunications sector, however, technological development has come to dominate the investments of resources. Demand research has led a miserable existence. Economics has generally been regarded as an inhibiting factor for technological development. It is therefore a gratifying development that recently all three sectors have been given a chance to influence telecommunications development with the positive weight that each one of them should have. Further intensified investment of resources should be allotted for development of demand analysis and economics. In that way we can best utilize the capital resources--which are limited in spite of everything--that are available to the telecommunications service. We will let demand analysis and economics become the aids they really are in furthering technological development, instead of regarding them as inhibiting factors.

A proposal for shaping a modernization strategy for the telecommunications net has been formulated in the concluding section of this article, "Summary of Principles for Continued Expansion."

Technological Development

The technological development within the information transmission sector is completely dominated by the method that the digital technology stands



CHANGED SPACE REQUIREMENTS FOR AN EXCHANGE WITH ABOUT 10,000 SUBSCRIBERS

A 204
AXE WITH ANALOG SUBSCRIBER STAGE
AXE WITH DIGITAL SUBSCRIBER STAGE
CONTROL ROOM =
POWER =
SWITCHING EQUIPMENT =

SUCCESSIVE CHANGES IN CABLE DIMENSIONS FOR TRANSMISSION OF ABOUT 10,000 CALLS

*) GLASS FIBER HANDLES ca. 10,000 CALLS
1935
1950
*)
1990

far. The superiority of the digital technology over the analog technology is indisputable and does not need analysis here. But the digital technology is far more costly so far than the analog technology. But the costs of the electronic equipment by means of which the digitalization will be carried out are following a more favorable trend than the costs of electromechanical and other equipment for the analog technology.

The basic principle for modernization of the telecommunications net should therefore be that:

> All new investment shall be on the basis of digital technology; i.e., expansion with electromechanical and analog equipment will be

stopped as soon as possible. Exceptions to this basic principle should be made, however, when there are strong reasons for doing so.

The object of getting a modern telecommunications net soon is, of course, embraced by all. Because of financing problems, profitability aspects, etc., the object can only be attained in the long term; i.e., beyond the time limit within which it is possible to make meaningful predictions.

The rapidity can be seen in the time horizons with which we must reckon in this connection. Renewing the entire telephone net would cost about 40 billion kronor at the present value of money, if we count all the costs involved in the new investment concepts to be applied from 1980-1981 on. Even if we could show profitability for such a complete conversion, just the mere financing problem would give time horizons of 25 to 50 years.

Now if it is not possible and advisable to proceed so radically, we should of course take selective measures adapted to the market demand. But the question is whether the mere reinvestment needs will not take up all the capital input that can be mustered. We must bear in mind that the lifetime of our installations is only some 25 to 50 years. Renewal would thus come about automatically because of our reinvestment needs.

But let us play with the notion that we shall renew the entire telephone net in, say, 25 years. What is really going to happen during that time? Will technological development stop? The historical trend of which we have experience indicates rather that development will continue to accelerate in the future as well. New technologies have emerged with generation cycles of 15 to 20 years. It would be presumptuous to believe that the digital technology of today would be mankind's last development product within the field of information and telecommunications technology.

The idea has been voiced, however, that the transition from analog to digital transmission of information is as revolutionary as the ancients' transition from hieroglyphics to alphabetic writing. The principle of conveying information by digital coding would thus endure for the foreseeable future, while the methods of digital coding would surely improve.

In any case we should pause a moment and realize that we shall always have to live in a telecommunications environment with continuous change. In it a conglomerate of various outmoded and modern systems must coexist and still be able to give individuals and society a service at reasonable prices that satisfies all the needs that exist and that may arise. We shall probably never get any completely uniform net of a technological type now known.

For these reasons it is unrealistic to speculate on a completely digital ideal net within the 15-year perspective we are attempting to survey here.

But for all that we should have a guideline and an aim for long-term projections. For that purpose it is necessary to work out an idealized picture of a net built on the new technology. It has been proposed that such an ideal net be given the name "reference net" and the definition "a non-localized net model by which a net's characteristics are specified in a certain respect." The term "target net" should be defined as "a localized net description that is set up as a target for net development within a certain specified period of time."

The thinking that the telephone net will be optimized after the pattern of a purely digital net may possibly be erroneous. In that case modernization becomes more expensive.

For that reason optimization and prioritization of the resources should instead be directed toward a realistic state of the telephone net, namely a continuously existing and continuingly "mixed net" made up of old and new technology.

Digitalization is gradually changing the telephone net. To an increasing extent the net will provide a high-capacitive digital transmission of information. The international discussions are therefore dominated by the idea that the long-term development will lead to a service-integrated net (ISDN = integrated service digital network). The international standardizing agencies are making great efforts to harmonize the development in that direction and to provide standards for it.

It should be observed here that putting our stakes on the general data net gives us a considerable freedom of action that many other countries lack. Needs for new services that require digital transmission can be largely met in the data net. Integration of services can therefore be treated as a possible optimization alternative for the long term. For the period of time we are discussing here, however, it would not be meaningful to speculate on a single telecommunications net for all transmission of information. The three nets for data, telephone, and telex must, particularly for economic reasons, be kept as separate nets. Traffic between the three nets will of course be arranged as needed.

Cost Development

An important fact in the cost development for expansion of the telecommunications net is that the costs of analog and digital transmission respectively are developing in different directions. While analog technology tends to become more expensive, it is calculated that digital equipment will decline in cost.

This development trend will not be continuous, of course, but will run at different times with varying periodicity. The MOTEK group (MOTEK = MOTE-Economy) has calculated for the long term that the costs of electromechanical switching equipment will increase by 8 percent a year in fixed money values. For electronic equipment, on the other hand, costs are expected to drop by an average of 5.5 percent a year. The corresponding cost increase for analog transmission equipment has been calculated at

6 percent while the digital transmission equipment decreases in cost by about 5.5 percent. In these calculations it is assumed that wages will increase by 3.7 percent a year.

An important feature of the cost development is the gains that digitalization offers through integration of switching and transmission technology (IST = integrated switching and transmission). This generally leads to a decline in costs of digitalization with increasing degree of digitalization.

Profitability Aspect

At today's prices new construction with AXE is considerably more expensive than with A-204. But with probable cost development the breaking point for investment costs will come some time in the middle of the 1980's. (See the diagram [on the next page].) On the line side, PCM [pulse code modulation] is often competitive even today, in spite of an analog environment, for the reason that existing cables or links can be better utilized. In addition, the advantages gained in operating and maintenance costs affect the balance, as well as the revenues that can result from new services.

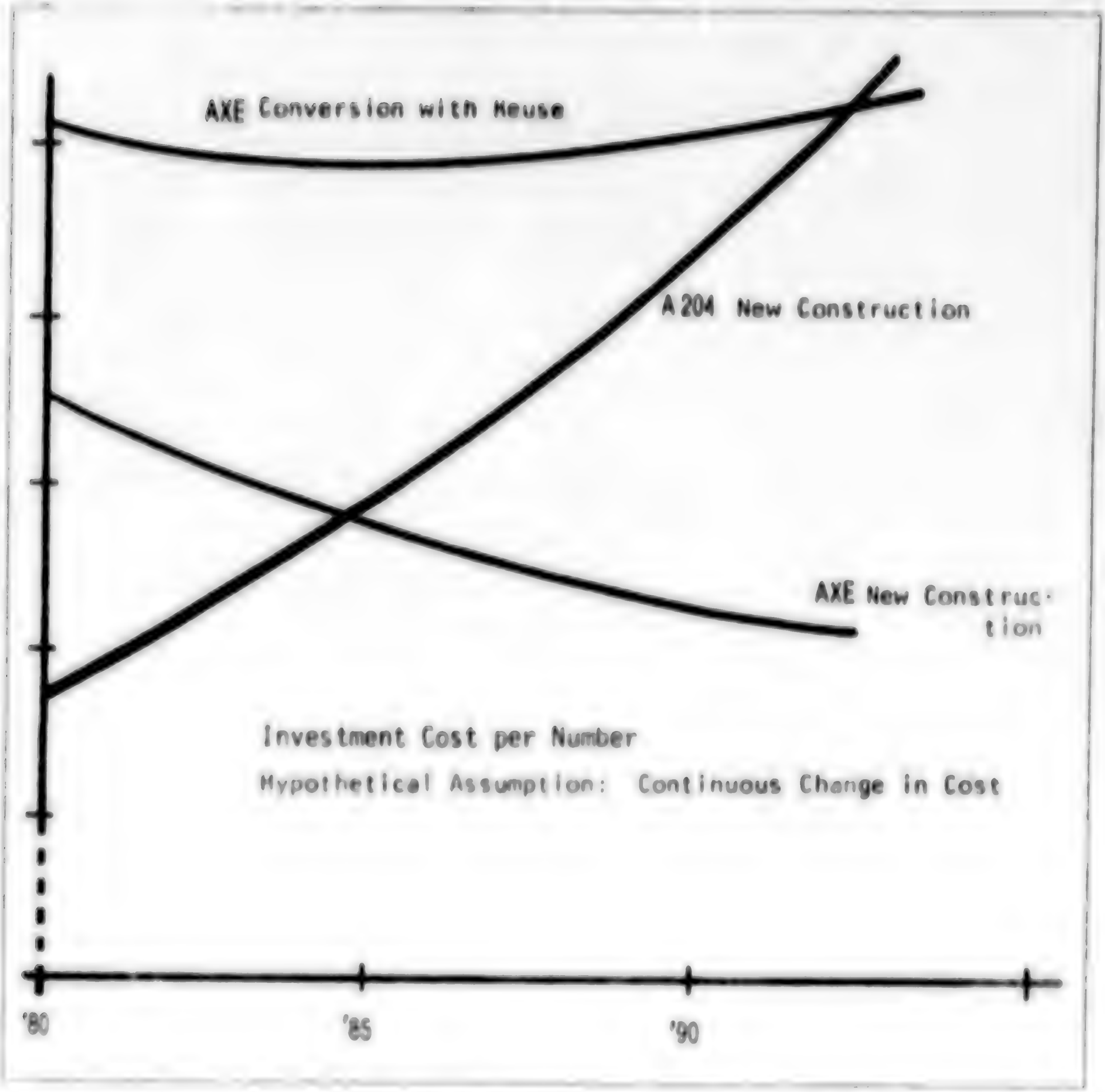
The first conclusion from this development should be that all replacements of old installations and all new construction will be done with new technology.

The growth of the telecommunications net is of the order of magnitude of 2 to 3 percent. Thus, for example, the growth of the local exchanges may be about 120,000 numbers a year, including about 100,000 numbers with A-204 equipment and the rest with AGF equipment. In the state net the needed increase is about 3,000 connections a year.

Generally speaking the increase is spread over all the installations in the net. This means a need for small increases at every installation. To make small increases at every installation with new technology would be very uneconomical because of the fixed costs and because of cross-traffic arrangements that would be very costly for the exchanges. In principle, therefore, the method should be to "kill" whole installations and reuse the dismantled equipment for enlargements at the remaining analog installations.

The breaking point for investment costs in this case of conversion with reuse of dismantled equipment can be expected to come some time during the first half of the 1990's. (See the diagram.) If we also take into account the gains from reduced operating costs and increased revenues from new services, conversion of A-204 equipment at the rate of total growth for the whole country should pay as early as the second half of the 1980's.

The second conclusion, therefore, should be that in principle expansion with analog equipment will cease as soon as is practically possible.



When it comes to conversion beyond the rate of growth, i.e. when the dismantled equipment cannot be reused, with the best will in the world it is impossible to find any profitability according to current critera of profitability. From the strictly economic point of view, therefore, conversion without reuse of the dismantled equipment should take place only in the case of reinvestment.

From the economic point of view the conclusion from this reasoning should be that modernization of the telephone net should be done at first only at the rate of reinvestment and at the rate at which growth for the country as a whole justifies reuse of the dismantled equipment. Modernization beyond that should be carried out only if the market demand can cover the increased capital consumption that arises from it.

Suitable objects for conversion should be selected with regard to market demand and other factors, such as the age of existing equipment, its compatibility (the need to enlarge may involve various types of equipment), the number and register capacity, personnel resources, size of the premises, integration between exchanges and transmission equipment, damping problems, standard switches made available, and relief of analog intermediate stations.

Investment Needs

One can speculate on what investments would need to be made under the above basic alternative.

The growth rate is 2 to 3 percent a year. With an estimated replacement value of 40 billion kronor for the present telecommunications net, that growth rate would involve investments of 800 million to 1.2 billion kronor.

The size of the reinvestment is determined by the lifetime of the installations. With an average lifetime of 25 years the ivestment required for this would be 1.6 billion kronor, and with a lifetime of 50 years, 800 million kronor.

The basic alternative of conversion at the rate of growth and replacement would thus require investments of between 1.6 billion and 2.8 billion kronor a year. Probably it would be of the order of magnitude of 2 billion kronor. Even this exceeds the scope of present investments.

Demand for New Services

The market side's views are for the present that very few and only exclusive services presuppose a digital telephone net. Under all circumstances a market analysis will be characterized by very great uncertainty, with a wide spread between demand forecasts.

When it comes to setting up alternatives for how this demand can be met, therefore, we must work today with wide margins for the various parameters that condition the demand structure.

Today an increasing demand is assumed for two types of service, namely

1) Additional telephone services, such as short number dialing, reringing, relaying, automatic conference calls, and universal number. These can be provided in AXE exchanges, but can also be made available in modern subscriber switchboards and terminals (apparatus).

2) Services that presuppose--or are favored by--digital transmission, such as teletex, fast telefax, and possible further development of teledata,

videophones, and conference TV. Teletex will be provided in the general data net. Digital transmission is also favorable for the additional telephone services listed in the previous paragraph, but is not necessary in order to provide them.

One demarcation (or prioritization) can be made at this point. It is only companies and public institutions that have any great need of these services, at least during the period of time we are working with. Moreover, they will be largely concentrated in the vicinity of large cities and other economic centers. These customers may also be the only ones that are willing to pay what it costs. Residential subscribers will therefore be given low priority in the modernization plan.

Parameters in Demand Analysis

The first question when it comes to giving alternatives for what measures should be taken in the telecommunications net is the *quantity* of digital services. A massive demand requires conversion of large parts of the telephone net or expansion of the data net. Limited needs, on the other hand, can be met by selective measures for the parts of the net where the need exists.

The *quality concept* must be explained in more detail. It is completely clear that for the foreseeable future we must count on it that large parts of the telephone net will be of the analog type. It is quite inconceivable to get a completely digital transmission, subscriber-to-subscriber, in the telephone net. If there is such a demand we must resort to selective special solutions, separate customer nets, or the data net.

But the question is whether the customer is so interested in how the transmission is done. It should satisfy the customer if he can send digital information that gets to the addressee in the same form. Digital/analog converters make it possible to use a mixed digital and analog net.
The quality demand for the new services must therefore be included in the market analysis.

The *time aspect* is an important part of the market research. The development of digital technology is going full speed ahead. For parts of the net there are already completed structures to be put into operation immediately, while for other parts it may be a long time before the development work yields economically defensible solutions. Chronological coordination of the development planning and the demand planning should constitute one of the foundations of the modernization planning.

To be able to prioritize the modernization measures it is necessary to localize the market demands *geographically*. To what extent do these demands apply to the local net, domestic net, state net, international net? The significance of the big city areas (multi-exchange areas) should be clarified.

The most economical solution for certain big customers with several switchboards is often an *internal net* of their own for the internal traffic. It should be in the interests of both the service and the customer for the telecommunications service to offer whole systems for the customer's communications needs, including direct connections between the switchboards, and thus optimize the customer's total traffic handling. The need for digital transmission facilities between switchboards can then be met by direct connections fitted into the telecommunications service's digital transmission system.

Market research should give an indication of what *transmission speed* is required for the various services. An interesting boundary line in this connection is between services that can get along with 64 kb/s connections and those that require higher speeds.

Another problem is the choice of modes of transmission. The question has to do with the choice of transmission on the ground net (cables, radio links) or by satellite. We can already say that services that can be offered on the ground net nationally or within Scandinavia are not economically justified by satellite. Possibly a Europe-wide alternative may be of interest (the ECS system; ECS = European communications satellite).

Interesting views have been advanced concerning a more flexible *rate structure* to make it possible to meet the threat and competition of private multinational telecommunications firms (SBS = Satellite Business System). Any rebate system to meet the threat of competition must then be weighed against the concept that the actual users of a high-quality net should pay the extra costs.

Net Formation Strategy

For obvious reasons, in replacement and new construction the location of modernization will be tied to the actual buildings. In conversion according to the growth philosophy and "rapid renewal" philosophy (see below), naturally the prioritization of the efforts will be done in such a way as to minimize costs and maximize revenues. Priority is given to the parts of the net that have the greatest market demand and/or where other profits or cost reductions can be obtained.

The net formation strategy to be applied in investing the funds required to implement the modernization plan will depend to an overwhelming degree on the market demand that market analysis comes up with.

A whole series of alternative net formations have been advanced, such as "digital islands in urban areas," "digitally connected urban-oriented net," "geographically dispersed digitalization," "thin overlay net with the possibility of using digital services for all."

The choice of net formation strategy will be a normal net optimization question when the market demand has been pinpointed and delimited. Whatever modernization strategy is chosen, the net formation variant or variants will be used that are cheapest for the current demand. All in accordance with normal principles of optimization.

Expansion of the Telephone Net

Modernization of the telephone net should be based on the profitability criterion. This means that replacements, new construction, and growth will be done with modern technology. Expansions for growth will be accomplished by conversion of suitable installations. Dismantled equipment will then be reused for the expansions needed in the analog parts of the net that remain. Suitable installations will be chosen with reference to the market demand and other profitability criteria. According to this plan the telephone net will be renovated in a time cycle that corresponds to the lifetime of the equipment in the net.

As a supplement to this basic alternative, the appropriateness and the cost of meeting the need of new digital services by faster renovation of the telephone net and thus leaving the public data net to develop according to the plans prevailing hitherto will be studied (see below).

The increasing costs for the telephone net in this "fast renovation" plan must of course be taken out in the form of rate increases if the profits from the digital services do not cover the costs. A rough computation indicates that the rates would need to be raised by about 50 to 60 kronor per subscriber per year for a 10-year reduction in the renovation cycle. That corresponds to a rate increase of the order of magnitude of 5 percent. Not an unreasonable measure, then, to get faster modernization. On the other hand, the financing is trickier to arrange. The increased investment in the example would be 400 million kronor a year. Together with the investment required according to the basic alternative, this would correspond to an investment need of the order of magnitude of 2.5 billion kronor a year at today's money value.

Telephone Exchanges

Under an agreement between the government and L.M. Ericsson, the telecommunications service has obligated itself to a large purchase of AXE equipment. Prevailing plans call for expansion totaling 347,000 AXE numbers through the 1981-1982 fiscal year and 24,000 numbers in the third quarter of 1982. Altogether this will convert 15 AGF stations completely and 4 AGF stations partially. About 1/3 of these numbers are to be supplied by Teli (138,000).

New production of AGF equipment by L.M. Ericsson is planned to stop in 1981-1982. Spare parts, however, are expected to be supplied for a 10-year period.

With certain exceptions usable dismantled equipment will cover needs for expansion of the remaining AGF exchanges throughout the 1980's. Problems will arise for the 36-V exchanges in Stockholm and Göteborg about 1983 and for stations of the Eskilstuna type about 1985. It should be pointed out, too, that many exchanges are already over 50 years old, and we should therefore calculate on an increased need of replacement. Some 244,500 numbers that will be used for replacement (manufactured after 1950) will be dismantled in connection with the "support purchase" from L.M. Ericsson. Only 70,000 numbers of this equipment will be reinstalled up to and including 1984-1985.

All estimates of cost trends thus indicate that the AXE system will become cheaper than the A-204 system during the second half of the 1980's.

So that the manufacture of A-204 equipment can be stopped as soon as possible, conversion of A-204 exchanges will begin in the last part of fiscal year 1982-1983. New production can then be gradually reduced. Oskarshamn will be the first exchange converted (pilot exchange). But AXE-10 equipment is economically justified only for exchanges larger than about 8,000 numbers, and the biggest increase at A-204 exchanges is expected to be at smaller exchanges. For that reason certain equipment (about 10 percent of the total installation volume) must be manufactured until a modification of the AXE-10 system better suited for smaller exchanges becomes available on a larger scale (1985-1986). If adequate progress is not made in this with the resources for such a conversion program, the conversion of AGF exchanges, according to present plans, will be scaled down starting with 1983-1984.

For the next few years the needs of exchanges with fewer than 200 numbers must be covered by replacing 200-number standard exchanges with A-204's. These conversions are expected to take care of the needs for expansion until digital concentrators are ready.

It is planned to put a digital concentrator in operation in the local line net during 1982. That concentrator will be placed indoors and connected to the AXE-10. It can then also cover certain shortages on standard exchanges.

A modification of the AXE-10 system suitable for small and medium-sized exchanges up to 12,000 numbers will be usable at various levels in the net. According to present plans the system is expected to be in full production in 1985-1986. In an initial stage, for reasons of growth, the expansions will be concentrated on terminals, since those exchanges now represent the biggest growth in the net.

At the existing intermediate exchanges there is about a 10-percent reserve at present. Current plans point out that earlier expansion plans can be reduced considerably if the reserves are better utilized, if the AXE exchanges can handle traffic between regions of Sweden starting in 1983, and if certain equipment can be made available and moved from the places where domestic exchanges have been converted.

If the AXE system acquires a relay function, the expansion of higher relay stations can be stopped. During a transition period the focus should be on releasing equipment at A-205 stations so as to meet the need for expansion of such equipment in analog parts of the net. Technical differences will probably mean that within a 15-year period some stations will have to be dismantled entirely to satisfy that need.

No new exchanges for communications with foreign countries of the A-206 type will be built, and expansions should be stopped when rerouting is made possible by the advent of AXE exchanges. Exchanges of the AXE-13 type--the domestic, relay, and international exchange at Hammarby, the domestic exchange in Fredhäll, and the relay station in Vidkärr--will be frozen at pretty much their present capacity.

Line Installations in General

According to this basic principle for modernization of the telecommunications net, all new investment should normally be in digital technology. The great increase in cost of cable laying has made system links in the form of radio links more and more competitive, especially in the state line net. The direction of expansion in the line net, just as for exchanges, should be that whole installations are converted and the equipment dismantled is reused for enlargements in the remaining analog installations. The conversions are directed toward the parts of the net where market demand and choice of design give the best economy for digital solutions.

The following digital systems are now ready to be put into operation or are in the process of development:

10-channel and 30-channel systems on conventional coil-loaded cables for distances shorter than 30 km are available.

30-channel, 120-channel, and 480-channel systems on radio links are available.

1920-channel systems both on coaxial cable and on radio links will become available in 1981 at the earliest. A pilot installation on radio link between Stockholm and Norrtälje is planned to be put into service in 1981.

A 7680-channel system on coaxial cable is expected to be ready for service by the end of the 1980's.

2 × 1920-channel systems on radio links are estimated to become available by the end of the 1980's.

31-channel systems above the telephone band in the carrier frequency net (DOV/DAV = data over voice in the coaxial system and data above voice in the radio link system) will be introduced in modern transistorized coaxial and radio link systems. All 8 MHz and 12 MHz systems can carry thirty-one 64 kb/s communications. Pending the digitalization of the state line net, the need for 64 kb/s communications is being met by using either 12-group or 60-group modems or DOV/DAV equipment. Cost computations have shown that DOV/DAV is profitable. A pilot installation has been decided on for the Stockholm-Norrköping-Jönköping-Göteborg coaxial line and the Stockholm-Göteborg radio link, which will be put into operation during the first half of 1982. DOV/DAV connections will be more profitable in the general data net.

2 × 480-channel systems with "radiomuldem" on radio links. In this system two 34 Mb/s streams are modulated in on one radio beam (double polarization). Twice the capacity is obtained on the same frequency width and at a relatively low cost. A Sundsvall-Härnosänd pilot installation is planned for 1982. Smaller systems (for 2 and 8 Mb/s) are on the international market but probably will not be introduced in Sweden.

In the whole of Sweden at present there is about 800 miles of raw wire installations in the interurban net, about 600 miles of it within the northern region. During the next few years a systematic modernization of these raw wire lines will be started.

As a replacement for the raw wire a number of alternative transmission media have been suggested, such as "new PCM-adapted twin cable" (plastic-MOK) and "new armored cable with built-in carrier line." The intention with the plastic-MOK cable is that in a first stage it will directly replace the raw wire with regard to both placement (strung on poles) and capacity. At a later stage the PCM system can be simply applied to the cable, since it is prepared for digital transmission systems. The intention with the "new armored cable" is that it will directly constitute a part of a digital system circuit.

In principle plastic-MOK is economically more advantageous for short raw wire lines, less than about a mile,* than "new armored cable with built-in carrier line + PCM." For longer raw wire lines, over a mile, "new armored cable with built-in carrier line + PCM" is to be preferred.

An extensive replacement of telephone poles has been completed. The decision to do this is motivated primarily by the fact that decay had been observed in a large number of poles. The wood institute's decay table for BIS poles shows that decay accelerates very rapidly after a pole age of 30 years. Improved methods of localizing the damage are being developed. A strategy will be worked out for replacement.

In a 15-year time frame it must be assumed that the optical fiber technology will be introduced in the national net. Examples of such applications are nets for wide-band services and connections with subscribers' digital exchanges. In the local nets of the cities the great capacity of fiber cable will be very usedful when existing cables and channelization are full to capacity. In the state net it will become profitable first for connections between radio link towers and relay stations.

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*The Swedish mile is equal to about 3 English miles.

Local Line Installations

The replacement value of the local line net has been estimated at about 15 billion kronor in today's money value. The value of the local cable net including the cost of laying (blasting, canalization, tunnels) makes up about 80 percent of the total replacement value. The remaining 20 percent represents the value of poles, etc. It is believed that the degree of utilization in the primary and the secondary net is low and it should be possible to raise it.

The average age of the local cable net for all telephone areas (except Göteborg and Helsinborg) has been estimated at between 15 and 21 years. The Göteborg net had an average age of 13 years and the Helsingborg net 25 years.

The following factors will affect the expansion and modernization of the local net:

Shifting the reference point brings into view the possibility of generally using 0.4 mm lines in laying out nets in high-density areas.

Connecting up in advance.

The possibility of moving the subscriber-stage functions out of the telephone exchange in the form of concentrators placed at points corresponding to the primary boxes of today. It is estimated that such equipment can be put into service for indoor placement during 1982 and for outdoor placement not earlier than 1983.

Connecting subscribers' digital switchboards with PCM systems.

Single-channel carrier frequency systems for subscriber circuits in operation in 1980.

Decreasing rate of growth in the number of main circuits.

Increased reinvestment needs.

Demands for environmental protection and workers' protection.

More effective planning.

Rationalization work in the form of improvements in equipment and methods.

Rural Line Installations

Present communications installations in the rural line net consist chiefly of coil-loaded cables or raw wire. The connections are of the two-wire type (about 160,000) and for the most part unamplified. The present transmission characteristics of the links restrict or at least render difficult the handling of services more advanced with respect to transmission than ordinary speech, e.g. facsimile, data, and radio transmission.

A thousand 30-channel systems are expected to have been put into operation by 1982 (222 as of September 1978). The bulk of these will be in the rural net and connect places that are not far apart and are relatively uninteresting from the market point of view.

State Line Installations

The greater part of the number of kilometers of lines in the present state line net are in the carrier frequency system on coaxial cables and radio links. If, on the other hand, we look at the number of connections, we find that half of them are on coil-loaded two-wire lines. With the exception of rather old 4-MHz radio link installations, the existing installations in the coaxial and radio link nets are in very good shape. The increase in the state net up to 1985 is expected to be about 3,000 connections a year.

In the worm-shaped state line net it is planned during the period up to and including 1982 to establish at least two 2,700-channel installations. For reasons of time these will have to be designed with FDM [frequency-division multiplexing] systems. The next installation (Stockholm-Malmö) is planned for 1984. Probably it will be cheapest to arrange direct digital installations for Stockholm-Göteborg and Göteborg-Malmo with taps at Norrköping and Jönköping. This means that digitalization of the long-distance state line net will be of small extent during the period.

A recently completed study recommends a new reserve route policy for the state line network (see below). If this recommendation is approved, line capacity (system transmission lines in the form of pairs of coaxial cables) will become available in the state line net. The cost of utilizing this capacity is low. For that reason serious consideration should be given to providing for an increased communications need on the stretches of line concerned by expansion with multiplex equipment of the FDM type.

After 1984 it will be time to consider converting one or more well-functioning analog systems in order to provide for the need for growth in the other analog installations.

Detailed analysis is now going on of the technical lifetime of multiplex equipment with tubes. Present plans indicate a certain amount of replacement in the early 1980's.

In the peripheral state line net the following digital installations are planned to be in operation in 1985:

One 1,920-channel system (Stockholm-Norrtälje, 1981),
About fifteen 480-channel systems (including one in operation now), and
About forty-five 120-channel systems (including 8 in operation now).

Foreign-Call Line Installations

According to the latest forecasts, the number of connections with foreign exchanges is estimated to be about 6,300 a year in 1982.

During the 1980's it is planned only to complete the links to Denmark, Finland, and Norway. An earth station for the ECS system, in Stockholm, is planned to be put into operation in 1983 and lessens the need for expansion of the foreign line net on the ground and of connections leased from foreign governments.

On the transatlantic marine cables TAT-5, TAT-6, and TAT-7 it is expected that TASI equipment will be incorporated during the 1980's. TASI (time assignment speech interpolation) means that use is made of the speech interruptions in the two channels of a telephone connection that occur when only one of the persons connected is talking at a given time. The system yields an increase in traffic capacity of at least 100 percent.

For the time being only connections in analog technology are in use. Certain international groups are now discussing the possibilities of introducing digital systems in 1985-1986.

A Scandinavian work group has studied the question of an all-Scandinavian installation practice for the Scandinavian international line net. The group submitted a proposal that involves complete joint utilization of the Scandinavian countries' total international installations both for traffic between the Scandinavian countries and for Scandinavia's traffic with European and intercontinental countries. It is estimated that an agreement can be concluded in March 1980. An agreement will mean savings for the Scandinavian countries of the order of magnitude of hundreds of millions of kronor during the 1980's, corresponding to a cost reduction of 20 to 30 percent for foreign traffic. The project will be the biggest ever carried out in Scandinavian telecommunications cooperation with regard to economic consequences, and is surely unique in form anywhere in the world.

Reserve Route Policy

The report RPPIS (Reserve Route Policy in the State Net) proposes an entirely new reserve route policy for the state line net. In broad outline, the proposal is based on the idea that connections on every link should be distributed (spread) over a number of different transmission routes so that the effects of failures on one line would be as small as possible. This may cause the present reserve capacity to decline or in some cases actually disappear in the worm-shaped state line net. Automatic packet switching (GRM [gruppomkoppling]) is recommended to be introduced throughout the carrier frequency net.

For the parts of the state line net where only one transmission route is available today, expansion with additional ones and construction of a second line is proposed, so that at least two transmission routes would always be available for each link complex. It is proposed to carry out this expansion of the state line net during a 10-year period with an investment of about 15 million kronor a year.

This new reserve route policy will thus mean that a number of lines (twin coaxial cables) of the FDM type will become available, and they can be used for expansion of analog connections.

A Scandinavian study group--the planning group--is now analyzing the question of a common Scandinavian reserve route policy for the international line net.

Number Situation in the Telephone Net

A shortage of subscriber numbers will develop within certain 4-digit state number areas during the 1980's. This is due primarily to the fact that control equipment at telephone exchanges of the conventional type offers limited possibilities for number analysis.

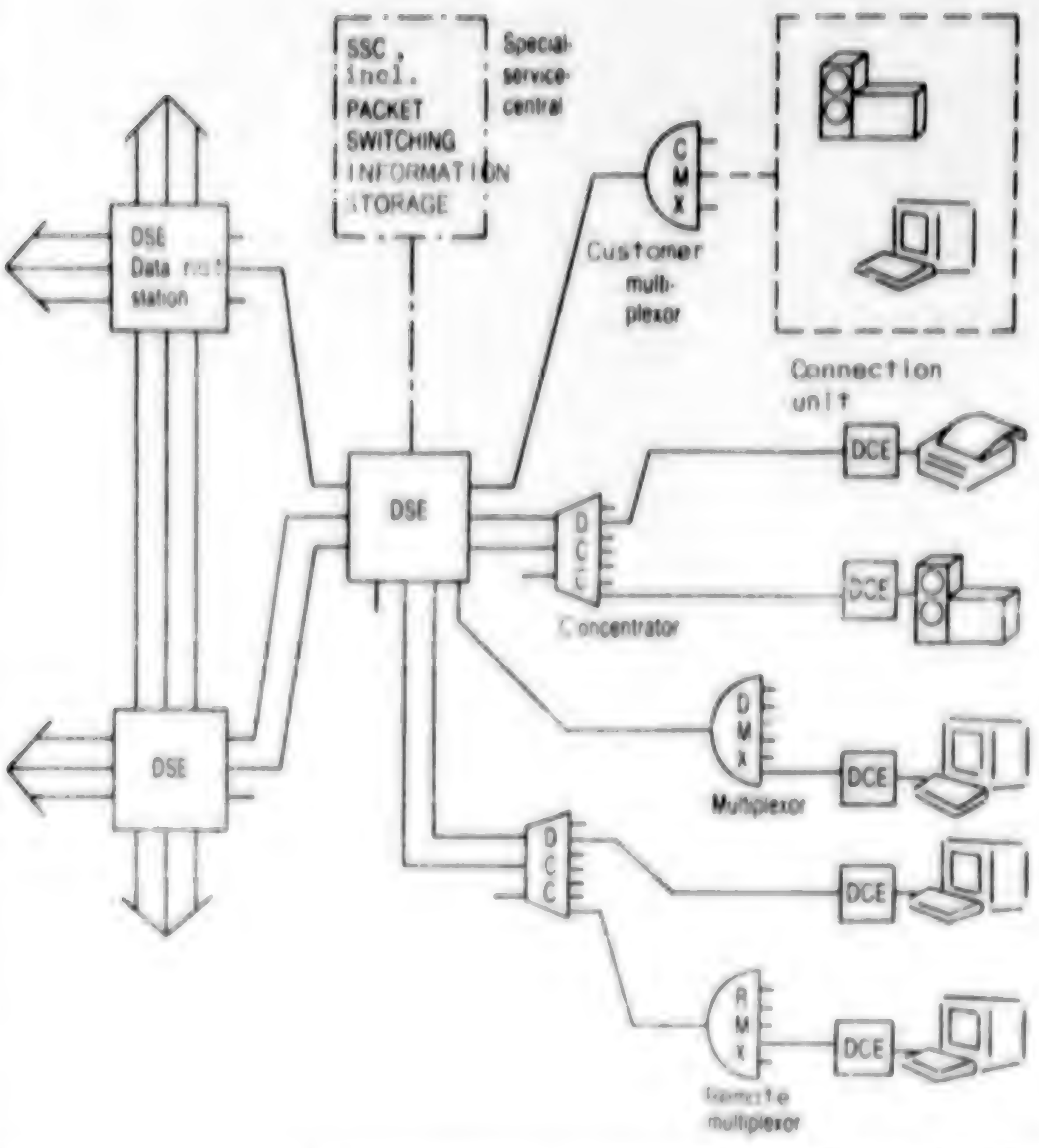
Number shortages are expected to arise in Enköping, Kalmar, Karlskrona, Luleå, Nyköping, Skellefteå, Södertälje, Visby, Värnamo, and Växjö between 1981 and 1985. It is estimated that Sweden's number needs can be provided for into the 1990's by making vacant 4-digit numbers available by what is called the "Kalmar method." In call-number areas with AXE the utilization of numbers is being improved considerably. In such areas a shortage of subscriber numbers hardly needs to be feared for the foreseeable future.

Expansion of the Data Net

The telecommunications net that is best equipped to provide services based on data transmission is obviously the data net. The demand for high-speed digital transmission can be met in the data net. Although the capacity is limited in the beginning, all the potential is there for expanding this net for greater capacity and high speeds. If that is done, the demand for converting the telephone net into a digital net will be determined by factors other than the need of new digital services. This plan should be far and away the fastest and cheapest way of creating facilities for handling possible market demands and future competitive situations.

The general data net will begin to be put into operation in 1980. It can already be seen that Phase 1 of this expansion has been delayed by more than a year. Phase 2 is planned to be put into operation by 1981. In view of the uncertainty in forecasts of the need of capacity in the data net, for the time being expansions are planned for only a year at a time. The connecting net between data stations and between data stations and concentrators is planned for expansion with 64 kb/s lines. In Phase 1 no multiplexors will be used. There is discussion of introducing multiplexors

PLANNED NET COMPONENTS FOR THE GENERAL DATA NET



In Phase 2, however, either directly connected to the data stations or in connection with the concentrators. The connections between data stations and multiplexors and between concentrators and multiplexors will also be of 64 kb/s quality. Other links, i.e. links to individual subscribers, will not be capable of transmitting 64 kb/s in these phases. These connecting links will allow 12 kb/s at most. In view of the 8 + 2 bit/word format used, information can only be transmitted between subscribers at a maximum of 9,600 b/s.

According to present forecasts it is estimated that there will be 25,000 data subscribers and 5,000 teletex subscribers in 1985. It is planned to have a total of 4 to 5 data stations and 100 to 150 concentrators in Sweden. The stations will be located in Stockholm, Göteborg, and Malmö. There will be capacity for other data-based services.

Thus if the public data net is used to meet the demand and the threat of competition that the demand for digital services may bring about, the data net must be equipped to handle higher speeds than 9,600 b/s. Within Scandinavia 48 kb/s can be put into operation as a generally available data service with a planning time of about 2 years. The speed of transmission on the lines will then be 64 kb/s. This means that only short non-coil-loaded pairs or FDM and/or TDM [time-division multiplexing] channels can be used. Thus the investments will depend entirely on the customer's geographical location.

The teletex services that it has been decided will make use of the general data net will demand capacity and expansion in the general data net. It is estimated that the teletex services can be introduced in 1981 with a transmission speed of 2,400 b/s.

It is hard to estimate the development of the data net over the long term. A natural objective for a 15-year period, however, would be to increase the availability of the highest speed classes (up to 48 kb/s) in high-density places and other centers of economic life. The strategy to be followed in the selection of such parts of the net should be determined by the market demand. One condition is that the expansions in these parts of the net, primarily the local and domestic line net, should as far as possible be coordinated with the modernization of the telephone net.

Beyond the planned intercommunication between teletex subscribers in the data net and telex subscribers, it may become necessary to extend this possibility to embrace all categories of subscribers in the data net. For the data net a need of intercommunication with the telephone net is foreseen as well, especially if the "packet switching" service is transferred to the data net.

Expansion of the Telex Net

An extensive modernization of the telex net is going on now. This program is expected to be completed by 1982. The modernization program involves conversion of the telex stations in Malmö, Göteborg, and Stockholm to PMS stations of the AXB-20 type and modification of other telex stations. With this modification of the substations, subscribers connected with them can be offered the same services as subscribers directly connected with AXB-20.

The introduction of the new teletex service that is intended to be served by the general data net should alter the policy for the continued modernization and expansion of the telex net. The teletex service, which is a development of the telex service to higher speeds and with possibilities of new services, is expected to slow down and even reduce the connection of subscribers to the present telex net. Toward the middle of the 1980's the growth of the telex net is expected to have ceased entirely. Therefore, no further modernization should take place, and expansion should be stopped as soon as possible.

Any new subscribers beyond the existing capacity at a given station will be connected by using dismantled equipment or by long distance lines. In the long term the connection will be made to the general data net, even though such a connection is considerably more expensive than connection with the telex net. This means not investing in the future in expansion of unmodern equipment at the substations. The general data net has the capacity to connect even asynchronous terminals such as telex apparatus and other teletype apparatus.

During the next 15 years the telex net probably will exist as a separate net. But toward the end of the period it will probably become profitable to concentrate the substations' subscribers at a smaller number of stations or to connect groups of subscribers via digital multiplex systems to another station or direct to the main stations. On the other hand, no shutting down of substations by reason of age is foreseen.

The reduction in numbers of subscribers will gradually result in excess capacity even in Stockholm, Göteborg, and Malmö. This will create a handling capacity that can be used if needed to provide for rapidly arising market demands.

Expansion of the Alarm Net

An entirely new telecommunications net for transmitting alarms is planned to be put into operation during the next few years. In a first stage in the spring of 1980 the net will be expanded to include about 30 of the biggest cities of Sweden. According to present plans, after about 3 years the net will embrace 800 to 1,000 processers. The cost of processers has been estimated at 20 to 22 million kronor. Connection costs are expected to be on a smaller scale.

Operation and Maintenance System

The new technology offers the possibility of exercising remote supervision and remote control from the position(s) most suitable functionally, organizationally, and geographically. This is made possible through centrally located computers in a system of the OMC (operation and maintenance center) type. The profitability is dependent on the number of AXE stations and the number of positions for remote maneuvering.

An interim solution is planned to be introduced in Stockholm and Göteborg in 1981-1982 for AXE stations. A definitive system can be expected to be on hand about 1985.

For conventional stations a collection system is being developed for measuring the traffic of individual units. That makes it possible to improve operation and supervision, with increased accessibility in the net as a result. A pilot project will be carried out in Kalmar and is expected to be ready in 1981. Thereafter it should be possible to introduce it gradually in other parts of the country within a 6-year period.

Eventually it is expected that the operation and maintenance functions of all installations can be coordinated.

Satellite Communications

Telecommunications satellite technology is undergoing intensive development. This development makes possible satellites with ever greater capacity and efficiency. The cost of satellite communications will therefore continue to decrease. Fewer and cheaper earth stations are becoming possible, even though restrictions have had to be made because of the limited access at frequencies and satellite positions in the geostationary orbit.

Satellite systems have very great band widths (hundreds of megahertz) and therefore provide transmission of high-frequency data--between large earth stations at rates of more than 100 Mb/s and between small earth stations with about 5-meter antennas at several tens of Mb/s.

Digital transmission will be facilitated by providing satellite systems with the TDMA (time division multiple access) transmission system.

In systems with small, cheap antennas (earth stations) it will naturally be profitable to establish terminals for satellite communications at many more places than in systems with big stations, in which at present an earth station requires an investment of 40 or 50 million kronor.

This development toward satellites with greater capacity, small and cheap antennas, and low costs of satellite communications has led a number of multinational big concerns within the information industry to put their stakes on satellite systems of their own. Satellite communications in these systems will be offered to big firms and other interested parties that have need for transmission of information at great distances. These customers can then provide for their entire telecommunications needs without the aid of the telecommunications authorities.

In North America a number of such systems will be put into operation during the next few years. Nothing prevents these telecommunications services from being offered to customers in Europe. It is therefore necessary for the [state] telecommunications service to have good handling capacity to meet such competition.

For Sweden's part, however, the starting position must be considered as extraordinarily good. We have a well-developed telecommunications net of high quality. Our foreign net is equally well planned for future needs. The ECS [European Communications Satellite] system will be able to meet the need for high-quality communications within Europe throughout the 1980's. Studies are under way for perfecting the ECS system into a system with the same possibilities as an SBS system. There is nothing to prevent the ECS system from being able to offer European customers the same services as SBS concerns by the middle of the 1980's.

Sweden has been a member of the worldwide INTELSAT organization (The International Telecommunications Satellite Organization) ever since it was established in the mid 1960's. The joint Scandinavian earth station in Tanum was connected with the INTELSAT system in 1971.

The Tanum station has been equipped to date with only one antenna, which works with the primary satellite IS IV-A in the Atlantic region (AOR). A second antenna is now being built and it is estimated that it can be put into operation early in 1980. In the middle of the 1980's a third antenna will probably be needed, and toward the end of the 1980's it is not unlikely that a fourth antenna will also be needed. A new satellite generation--IS VI--with partly new advanced technology is planned to be available in 1986.

Partly because Iceland is getting a new earth station in 1980, our telecommunications with that country will be considerably improved. During the coming decade it is predicted that a number of new direct connections via the INTELSAT system will become profitable, chiefly with countries in South America, Africa, and the Far East.

In 1978 the telecommunication service signed the agreement that means participation in the European satellite system ECS as a member of the EUTELSAT organization (The European Telecommunications Satellite Organization), with estimated of time of effect in 1983. The marginal costs of making use of ECS connections with South and Central Europe will probably be lower than for corresponding connections via land lines. For that reason a relatively large part of foreign communications in the future will probably be via ECS. A Swedish-owned all-Scandinavian earth station for the ECS system will be erected just south of Stockholm.

A maritime system for satellite communications with vessels will be implemented during 1980 within the framework of the INMARSAT organization (The International Maritime Satellite Organization).

A Scandinavian earth station for joint Scandinavian use will be put into operation in Eik in 1981. This will considerably improve the telecommunications facilities of the world's merchant fleets as compared to the HF system now used. At the same time it will become possible to automate maritime services.

Summary of Principles for Continued Expansion

The basic principles for modernization and expansion of the Swedish telecommunications net should therefore be that:

New manufacture of electromechanical and analog equipment for exchanges and line installations as soon as possible, all replacements and new construction to be done with new technology;

Modernization is done primarily at the rate of replacement needs and at the rate that the nationwide growth justifies reuse of dismantled equipment;

Modernization beyond that rate is done only if the market demand for new services covers the increased capital consumption for the purpose;

The expected demand for new services is channeled either to the telephone net or to the data net and/or PABX terminal solutions;

Services that presuppose digital transmission are provided to an appropriate extent in the data net;

Intercommunication between the telephone, telex, and data nets is arranged as needed to be able to continue to provide the services offered by the telecommunications service;

A facility is established for customer-oriented solutions, e.g. for such services as require transmission speeds above 48 kb/s;

The data net is equipped as soon as possible to handle conceivable services based on data transmission, e.g. digital transmission speeds up to 48 kb/s; and

Expansion of the telex net is stopped as soon as possible and no further modernization takes place.

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